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ABSTRACT

Ryerson Open College in collaboration with the Ontario Educational Communications Authority, offered a multimedia, introductory credit course in psychology in 1972. An evaluation was completed based on two questionnaires, each completed by a majority of the enrolled students. Student grades and dropout rates were examined relative to students' age, sex, employment status, previous education, and socioeconomic status. Students also rated the relative merits of televised lectures, radio discussions, and other educational activities, and these results were correlated to demographic factors. The benefits and disadvantages of the multimedia, home-study approach were examined relative to its cost. (FMH)

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The Ontario Educational
Communications Authority

Research and
Development Branch

Number 35

Evaluation of a Media-Based Credit Course, Developmental Psychology, Offered by Ryerson Open College.

by

G. Harry McLaughlin, Ph.D.

August 1973

IR 002 818

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1. Course Objectives

Developmental Psychology was a multi-media credit course offered by Ryerson Open College, in co-operation with the Ontario Educational Communications Authority, from January through June in 1973. The specific objectives of the course were:

> To present information, ideas, theories, and experiences which will describe and clarify the formation and development of human personality.
>
> To help the students to establish the connections between cause and effect as they pertain to human behaviour.
>
> To present the family and other human institutions within the context of history and the culture, as they influence the shaping of personality.
>
> To comprehend the full life of man (birth to death), but putting the main emphasis on the first three major periods of life: birth and infancy, childhood, and adolescence and young adulthood.

More generally, the goals of the course were:

> To stimulate the students to think, through presentation of a framework within which human development can be understood.
>
> To challenge the students' assumptions about human growth and behaviour: their own, other people who resemble them, and people who are different.
>
> To establish a beginning understanding of those forces, both intrinsic and extrinsic, which shape and influence human development and the formation of values.

2. Course Components

The course was presented through methods which had proved generally successful in the Introductory Sociology course which was offered in the Springs of 1971 and 1972. Apart from two weeks devoted to mid-term and final examinations, in each of the 25 weeks of the course, there was an hour-long lecture and a half-hour panel discussion, usually featuring a guest who was an authority on the subject of the lecture. The lectures and discussions were broadcast on FM radio by CJRT, the station of Ryerson Polytechnical Institute, Toronto. The discussion, which was occasionally pre-empted by a continuation of the lecture, was followed by a half-hour open line session, in which students could telephone CJRT so that they could question the instructor in the studio and hear her responses over the air.

The theory lectures were broadcast at 1:30 p.m. on Mondays and repeated at 9:00 p.m. the same day. The discussions were broadcast and repeated on Wednesdays at the same times; the open line sessions were broadcast live at 2:00 p.m. and 9:30 p.m. The lecture and discussion were also repeated on Sundays from 11:30 a.m. to 1:00 p.m.

Every two weeks a film on the theme of the lectures was broadcast by the Ontario Educational Communications Authority's Channel 19 television station, CICA. The original broadcast at 2:30 p.m. on Sunday was repeated on Tuesdays at 9:30 a.m. on Channel 9 by CFTO, the CTV Network station in Toronto, and on Saturdays at 8:30 a.m. on Channel 11 by Hamilton's independent station, CHCH.

During the course, students were required to write two essays in addition to five smaller essay-type assignments. All assigned reading material was provided in a workbook and five textbooks, (worth $20.00), which were given to the student in return for the course fee of $80.00. The workbook also contained directions for the assignments and topical bibliographies for optional reading.

Each student could correspond or talk by telephone with the tutor who marked that student's assignments. In addition, students were invited to meet with the course staff at study week-ends held early in March and at mid-May.

3. Comparison with Day School

A course parallel to that given by Ryerson Open College (hereafter abbreviated to ROC) was offered, starting in September 1972, by Ryerson Polytechnical Institute, hereafter referred to as the Day School. The

course was required for all Day School Nursing and Fashion students.

This evaluation is based largely on data gathered from two questionnaires, reproduced in Appendix A, which were administered to both ROC and Day students near the beginning and end of their respective courses. Each questionnaire was followed by the same 42-item multiple-choice test of knowledge about developmental psychology, so that the students' gain of information could be measured. The test is reproduced in Appendix B. The second main questionnaire was formulated to a considerable extent to qualify ROC students' attitudes towards the electronic media used in the course; their attitudes were first revealed in responses to open-ended questions asking for comments on radio and television contained in a mini-questionnaire distributed at the first study weekend, held after the eighth week of the course. A detailed analysis of the responses to these open-ended questions is given in Appendix C, which will be cited without further reference as necessary in the body of this report. Appendix C was written by Miss Dorene Jacobs, who was also engaged to assist in devising and administering the questionnaires. The present writer (hereafter abbreviated to I) was responsible for supervising all stages of the project except for preparing the first questionnaire administered in the Day school. Responses to the main questionnaires were coded and reduced to punched-card form by a private market research firm; the punched cards were then submitted to the computer group of the Ontario Institute for Studies in Education for tabulation and statistical analysis.

In this study the main questionnaires were analyzed only for those respondents who completed both the pre-test and post-test of knowledge, in order to make for maximum comparability between the response patterns of the ROC and Day students. By coincidence, both questionnaires were completed by 55% of each group.

In order to be included in the sample, a student had to be present on both occasions that the questionnaires were administered. Because the more successful students generally have the better attendance records, you would expect both ROC and Day samples to comprise somewhat superior students. A comparison of final grades awarded to members of the samples with the grades gained by the remainder shows that there is indeed such a bias, but it seems not serious enough to impair the generality of the conclusions to be reached in this report, especially as both ROC and Day school samples are biased in the same direction. However, the reader must keep in mind that nearly all the tables give demographic and other statistics only for the samples and not for the entire parent populations.

4. Demographic Characteristics

It was only to be expected that ROC students would differ in nearly all respects from Day students. This expectation is borne out by the data. For illustration, comparative data on sex, age, educational and employment distributions are given in Table 1, which shows that, whereas all Day students sampled were female, nearly a quarter of ROC students were male. Nearly three-quarters of ROC students were aged 31 to 50, whereas only one Day student was over 30. More than half the ROC students had had some post-secondary education, but a fifth of them had not completed grade 12; nearly all the Day students lay between these two extremes, 9 out of 10 having completed grade 12 or 13. More than half the ROC students were working at the start of the course, most of them full-time, compared to only about a third of the Day students, and naturally their work was only part-time.

Table 1 also compares the 1973 ROC Developmental Psychology students with the 1972 ROC students who completed the Introductory Sociology course. There are considerable similarities between these two groups. Part of the similarity is traceable to the fact that 21 of the 58 ROC students had taken Introductory Sociology with ROC.

Incidentally, it is worthy of note that three of the Day students had also studied the ROC Sociology course.

5. Measurements of Knowledge

We will return to the detailed comparison of Day and ROC students later when we examine possible determinants of success in the course, but first let us see whether there was a difference in the overall performance of the two groups. The relevant data are given in Table 2, which shows that, on average, the final ROC scores on the 42-item post-test of knowledge were almost 10 percent ahead of the Day scores. However, the percentage improvement shown by the average Day student was just double that of the average ROC student; this is because the mean pre-test score for Day students was 17.52 as against the ROC mean pre-test score of 23.49. As pointed out in Appendix B, these latter could be indicative of relative degrees of test sophistication rather than of knowledge: two Day students did manage to score below the theoretical chance level of 10 on the pre-test, but the strategy of choosing the longest multiple-choice answer gives a score of 17, and picking from the remaining questions the answers "all of the above" or "none of the above" could bring the score up to 22 (or 21 if in the one case where these two stratagems conflict, the student guessed wrongly).

Table 1. Percentages of Day and ROC Developmental Psychology course students distributed by demographic groups (with comparative data for 1972 ROC Introductory Sociology students given in parentheses).

	Day %	ROC %	%
Sex			
Female	100	78	(85)
Male	0	22	(15)
Age			
Under 21	48	2	(3)
21-30	50	17	(17)
31-40	2	35	(33)
41-50	0	38	(40)
51-60	0	8	(7)
Education			
Completed grade 8,9,10 or 11	4	20	(18)
Completed grade 12	54	16	(20)
Completed grade 13	35	9	(18)
Some post-secondary	7	48	(43)
University degree	0	7	(1)
Employed time			
Full-time	0	40	(40)
Part-time	35	14	(21)
Not employed	65	46	(39)

Note: In this and subsequent tables of percentages, the figures are rounded to the nearest whole number and therefore may not sum exactly to 100%. Unless otherwise stated, the base is 46 for Day students and 58 for ROC students. (The 1972 ROC base is 90.)

Table 2. Average post-test knowledge scores and percentage improvements over pre-test scores.

	Day	ROC
Mean post-test score	25.3043	29.2069
Standard deviation	3.7999	5.6871
Mean percentage improvement*	56.9548	28.2920
Standard deviation	77.0313	26.7318

*Calculated from: $\frac{100}{N} \times \sum_{j=1}^{n} \frac{\text{jth post-test score} - \text{jth pre-test score}}{\text{jth pre-test score}}$

Fortunately, there is no doubt that the mean scores on the post-test are above chance level. What is less obvious at first sight is whether the final ROC scores are indicative of a real advantage over the Day students, considering that the standard deviations are of the same magnitude as the difference between the two means. In fact, there is less than one chance in a hundred that the two populations really have the same degree of knowledge and that the apparent difference arose simply from the hazards of sampling. Details of the modified statistical t-test used to reach this conclusion are given in Appendix D.

Perhaps the statistical gobbledygook of Table 3 should also have been decently buried in an appendix, but if, gentle reader, you will bear with me, an interesting conclusion can be drawn from it. The computer was programmed to calculate the line which would go as near as possible to as many points as possible if each student's performance was plotted on a graph with pre-test scores on one axis and post-test scores on the other. The algebraic formula of such a line, the regression equation, can then be used to predict the post-test score from the pre-test score. In the top part of Table 3 the regression equation for ROC scores is given, together with an analysis of variance which shows that the fit of the regression line to the data is as good as possible, thus justifying the selection of an equation for a straight regression line. The two constant numbers in the regression equation itself are positive and large enough to ensure that the predicted post-test score will always be greater than the pre-test score (which is reassuring), but the multiplier is less than unity, which means that those who knew more to begin with acquired proportionately less knowledge than their originally less well-informed

Table 3. Regression equations for predicting post-test knowledge scores from pre-test scores, analyses of variance, and correlation coefficients.

ROC

Predicted post-test score = 12.793 + (0.698 X pre-test score)

Standard error of multiplier = 0.091
Correlation, pre- and post-test = 0.714

Source of variation	d.f.	Mean squares	F
Regression	1	940.840	58.37***
Residual	56	16.119	

*** Significant beyond 0.1 percent level

Day

Predicted post-test score = 21.630 + (0.210 X pre-test score)

Standard error of multiplier = 0.133
Correlation, pre- and post-test = 0.231

Source of variation	d.f.	Mean squares	F
Regression	1	34.533	2.47 (N.S.)*
Residual	44	13.982	

*Not Significant.

colleagues. This is only to be expected if some questions in the test are easier to answer than others/and, as we have seen, some of them certainly were!

On the other hand, the analysis of variance for the Day students' regression equation shows that it gives a very poor fit which is inevitable considering the very low correlation between their two sets of scores. Such a situation would be likely to arise if the original scores were largely the product of guesswork, having therefore little relation to the final scores, which are nearly all too high to be primarily due to chance.

We may therefore conclude that the Day pre-test scores (which, averaged 17.52, it will be remembered, out of a possible 42) were not merely less than the ROC pre-test scores (which had a mean of 23.49), but that they represented even less real knowledge than the figures at first sight suggest.

6. Effects of Previous Education

Nearly all Day students had taken a psychology course before, whereas only a third of ROC students had done so. This is shown in Table 4, which is surprising not in that it reveals that the professionals (teachers, nurses and social workers) had studied psychology before, but in the small amount they had previously studied.

Table 4. Percentages of students claiming to have taken one or more previous psychology courses, with ROC students subdivided by occupation.

	1 course	2 courses	3 courses	None
All Day students %	94	2	0	4
All ROC Students %	25	5	2	68
Manual workers %	--	--	25	75
Clerical, sales people %	14	5	--	81
Housewives, etc. %	--	--	--	100
Teachers %	46	--	--	54
Nurses %	33	11	--	66
Social Workers %	50	25	--	25

Table 5 shows that four out of every 10 ROC students had never taken a credit course previously: this was the case even with half the nurses and teachers. Half the students who had taken a course before had taken Introductory Sociology with ROC: three clerical-sales people in the Day school also claimed to have taken this course.

Table 5. Percentages of ROC students claiming to have taken a credit course previously.

	%
ROC Introductory Sociology, last academic year	36
Another course, about two years previously	12
Another course, three or more years previously	14
No previous credit course	38

To find out what effect previous education had on learning developmental psychology, average post-test scores were calculated for students of varying educational attainments and with varying amounts of experience of similar courses. Table 6 shows that on the whole, those who had studied psychology before did a little better than their colleagues, but the number of ROC students who had taken previous courses, and the number of Day students who had not, are so small that no reliance should be placed on the finding.

Table 6. Mean post-test scores tabulated by number of previous psychology courses taken, by experience of ROC Sociology course, and by education.

	ROC	Day
No previous psychology courses	28.55	25.50
One course	31.07	25.26
Two courses	30.33	27.00
Three courses	28.00	-
No previous ROC course	29.43	25.36
ROC Introductory Sociology course	28.90	26.00
Grade 8	23.00	-
Grade 9, 10 or 11	26.10	25.00
Grade 12	31.22	26.16
Grade 13	31.60	23.94
Some post-secondary	29.04	25.67
University degree	31.50	-

Again, no reliance should be placed on the finding that ROC students who had studied Introductory Sociology did less well than newcomers to ROC, because the difference between the mean scores of the two groups is negligible. There is a suggestion of a trend, among ROC students at least, that indicates the higher the school grade a student had completed, the more developmental psychology she learned, but students with post-secondary education did less well than might be expected - which confirms a finding of my earlier report on the ROC Introductory Sociology course.[1]

7. Effects of Sociological Variables

It might be expected that students less familiar with the English language might have more difficulty with the course. As Table 7 shows, ROC had less than one-tenth of students whose mother tongue was not English, compared with more than a quarter of students in the Day school.

Table 7. Percentages of students still understanding their mother tongue.

	ROC %	Day %
English	91	72
Chinese	0	9
Slavic	5	7
Italian	2	4
German	2	2
Dutch	0	2
Maltese	0	2
Greek	0	2

[1] G.H. McLaughlin, Evaluation of the Ryerson Open College Introductory Sociology Multi-Media Course, Toronto: The Ontario Education Communications Authority (Research Report Number 27), 1973.

But this will not explain the general superiority of ROC with respect to knowledge test scores, because the averages of native speakers of foreign tongues were only trivially below the averages of those born to English-speaking parents, as is shown in Table 8.

Table 8. Mean post-test scores of students whose mother tongue was English and those who still understand some other mother tongue.

	ROC	Day
English	29.23	25.49
Other tongue	28.80	24.85

Another factor which seems to have had no effect on ROC students' ability to learn was their distance from Metropolitan Toronto. More than a quarter of them lived outside Metro (see Table 9) and these people might have had more difficulty in obtaining additional reading materials, attending study week-ends and receiving all the broadcasts. Had any Day students lived outside Metro their studies might have been adversely affected, but none did, and the ROC course materials provided were apparently sufficient to avoid the need for recourse to the facilities of the city. (It should, however, be noted that early in the course the radio instructor referred several times to a paperback which she thought was easily obtainable in Canada: actually, there were only about six copies in all Toronto, but when this was brought to her attention ROC had copies rushed in from the U.S.A.)

Table 9. Percentages of students living inside and outside Metropolitan Toronto.

	ROC %	Day %
Within Metro	72	100
Within 30 miles of Toronto	19	0
Between 30 to 50 miles	9	0

One factor which one might not expect to predict success in learning about developmental psychology is possession of a colour television set. However, those who had only a black-and-white set did less well. It is my personal theory that black-and-white television induces a mental set for learning, whereas colour induces the viewer to prepare himself for a more emotional, aesthetic experience. This theory may be fake, but it is certainly not falsified by the present study, because the people who did best of all in the post-test of knowledge were those with both colour and black-and-white sets, as Table 10 shows. People with colour television are no doubt the people with more money, and those who have both kinds of sets are probably those with the best living accommodations, so that they are likely to have the best environment for study. Furthermore, those with colour television had more time to study, because fewer of them were employed outside the home.

Table 10. Mean post-test scores of ROC students tabulated by colour television possession and percentage in each category not employed.

		% Not employed
Black-and-white	28.41	41
Colour	29.75	55
Both	30.25	50

8. Effects of Occupational Variables

Let us now look more closely at the occupations of the students, for two reasons: first, it would be valuable to confirm the finding of the ROC Introductory Sociology course evaluation, that people who had most time at home did best; second, it is important to find out whether the ROC course really appealed to people who could not normally find time to take a credit course, or whether the students could easily have gone to classes at an educational institution, had they wished to do so.

To begin with, let it be noted from Table 11 that nine out of every 10 ROC students had at least three years work experience; indeed, nearly half of them had been working for more than 10 years. Such people do not take kindly to going to classes with people recently out of school. Still, if they had time, they could have gone, say, to York University's Atkinson College for night classes. Few of them do seem to have had the time, judging from Table 12.

Table 11. Percentages of ROC students with various numbers of years of full-time work experience, and percentage in each category who were employed at start of course.

	ROC	Employed
Under 1 year	7	0
1 to 2 years	2	0
3 to 4 years	19	64
5 to 10 years	28	44
Over 10 years	44	68
Base	57	31

Table 12. Numbers of ROC students in various occupations tabulated by sex and employment at start of course (numbers doing night-work given in parentheses)

	Full-time	Part-time	Not employed
Women			
Clerical, sales people	5 (1)	2 (1)	13
Teachers	4	2 (1)	3
Nurses	3 (3)	2	4
Social workers	1	1	-
Housewives	-	-	5
Men			
Manual workers	2 (1)	1	1
Teachers	4	-	1
Social workers	2 (1)	-	-
Clerical, sales people	2	-	-
Totals	23	8	27
Numbers with no children	9	2	6

More than half were working outside their homes, and of these people, a quarter had to do some night-work, so that even if they could arrange their schedules to get to night classes, their irregular routines would probably make it hard for them to follow a regular course. As for those not employed outside the home, it is evident that most of them had plenty of work there because about four-fifths of them had children to look after. Remembering that the sample considered here consists entirely of people who managed somehow to escape their commitments long enough to attend two study weekends, it seems almost certain that the students not in the sample were those who could not manage to get away even for what were the most stimulating highlights of the course. Thus, there can be little doubt that the vast majority of ROC students would have found it very difficult to take a credit course in any other way.

If one looks at the occupations of only those employed at the start of the course, it does seem that professionals constituted an excessive proportion of the students. On the other hand, clerks, sales people, manual workers, housewives and other non-professional people constituted 54% of the total sample (see Table 13).

Table 13. Percentages of all ROC students and of employed ROC students with various occupational backgrounds.

	All %	Employed %
Non-professionals		
Clerks, sales people	38	29
Manual workers	7	10
Housewives, etc.	9	0
Professionals		
Teachers	24	32
Nurses	15	16
Social workers	7	13
Base	58	31

It might be expected that professional workers would do better than the non-professionals in a credit course. In fact, as Table 14 shows, the professionals fared somewhat worse. The explanation probably lies in

Table 14. Mean post-test scores of ROC students tabulated by profession and sex with percentages of non-employed in each category.

	Score	Not employed
Professionals	28.74	30%
Non-professionals	29.96	61%
Men	25.62	15%
Women	30.24	56%

the fact that less than a third of them were not employed, while twice as many non-professionals were not employed, so that more of them had extra opportunities for study. (The small proportion of unemployment among male students would likewise account for their very poor showing in comparison to the women, of whom four times as many were not employed outside the home.) Still it appears that the professionals, generally speaking, had rather poor paper qualifications: 30% of them did not lay claim to any post-secondary education. It is a reasonable surmise that many teachers, nurses and social workers found that ROC gave them an admirable opportunity to test their ability to return to academic study without any of the embarrassment they might feel in a classroom situation where their lack of learning would probably become evident to others.

It was suggested above that the more time a student had at home, the more he was likely to learn. If this hypothesis is true, it should apply equally to Day students, whose occupational backgrounds are summarized in Table 15. There is indeed a clear trend among ROC students for those not employed to gain higher knowledge scores than the fully employed, with part-time workers scoring somewhat lower than the not employed, a phenomenon also apparent among the Day students (See Table 16).

It was also suggested that doing night work, however occasionally, might have an adverse effect on study. Table 16 also bears out that contention.

Table 15. Numbers of Day students of various occupational backgrounds tabulated by employment at start of course (numbers doing night-work given in parentheses).

	Part-time	Not employed
Clerical, sales people	15 (14)	24
Teachers	1 (1)	1
Students	--	5

Table 16. Mean post-test scores tabulated by working hours at start of course.

	ROC	Day
Not employed	30.82	25.47
Working part-time	29.63	25.00
Working full-time	27.17	-
Working days only	28.89	23.60
Some night work	25.36	24.75

9. Effects of Experience With Children

In a course on Developmental Psychology, experience with children should be a considerable asset. Just over half the Day students claimed to have worked with children (see Table 17); just under half the ROC students made the same claim, but doubtless had they too considered mentioning baby-sitting, the proportion of claimants would have been much higher. In any case, there is no clear relationship between work with children and knowledge of developmental psychology as measured by the post-test.

Table 17. Percentages of students who had worked with children.

	ROC %		Day %	
Teaching school	19		4	
Teaching pre-school	16		4	
Nursing children	5		0	
Youth work, Brownie leader	5	50	2	12
Probation work	3		0	
Mother's help	2		2	
Camp, playground supervision	2		20	
Selling to children	2		2	
Baby-sitting	0		11	
No work with children claimed	46		55	

So let us consider whether experience in bringing up one's own children affects scores on the post-test. Table 18 shows that the majority of students in every occupation except manual work had the responsibility of bringing up children. Turning now to the average post-test scores of ROC students, there is a marked and consistent trend such that the more children a student had, the more knowledge she demonstrated, as is clear from Table 19.

Table 18. Numbers of ROC students with children, tabulated by occupation.

	One Child	Two Children	Three Children	Four or Five	None
Clerical, sales people	4	6	4	4	4
Teachers	2	3	2	1	6
Nurses	-	5	1	1	2
Social workers	1	2	1	-	-
Manual workers	1	-	-	-	3
Housewives, etc.	1	-	1	1	2
Percentage of all ROC students	14%	29%	16%	12%	29%

Table 19. Mean post-test knowledge scores and mean percentage improvements over pre-test scores for ROC students, tabulated by the number of their children, with the percentage employed in each category.

	Knowledge Score	% Improvement	% Not Employed
No children	26.83	20	35
One child	28.88	6	25
Two children	29.35	40	30
Three children	30.44	37	78
Four or more	30.85	21	100

This trend is not explicable in terms of freedom from work outside the home, because Table 19 also shows that, although hardly any mothers of three or more children were employed elsewhere, the correlation between employment and family size was very low.

The fact that people with more children tended to have more knowledge at the end of the course may mean either that they did not learn so much because they had more knowledge in the first place, or that they learned more because their experience with children gave them a frame of reference which enabled them to understand and retain the knowledge being imparted to them in the course. The percentage improvements are so distributed among the various categories in Table 19 that one can see that knowledge demonstrated in the pre-test was very little related to the numbers of students' children. It must therefore be concluded that the course provided information which was most meaningful to people who had to cope with the problems of psychological development nearly every day of their lives - which was one of the main goals of the course.

This finding may also be considered as providing some validation for the knowledge test itself. It was expected to test for information specific to the course, rather than for general knowledge; as mentioned earlier, we should have a prior expectation that experience with children should give rise to higher stores. Both these expectations were fulfilled, thus indicating validity.

10. Preferred Means of Learning

Students were asked to rate several means of learning as the first,

second, and third most effective. In retrospect, this is a methodologically poor approach to obtaining an overall rating of the different items, because some students may have ordered sets of preferences for all the items, which would not be measurable from data restricted to three choices. It is also possible that some ratings are spurious because a respondent is indifferent between all choices after, say, the first two, so that her forced third choice does not reflect her true attitude to that item. Possibly, therefore, it would have been better to set up a single list of weighted preferences and requested respondents to rate as few or as many items as they wished. However, the restriction to three choices was made in the initial questionnaire distributed to Day students[1] -- perceived appropriate at the time--and, to ensure comparability, the procedure was followed in the remaining questionnaires.

Table 20 compares first choices of the means from which students at the start of their course expected to learn most and of those from which students toward the end of the course claimed they had actually learned most. It can be seen that toward the end the lectures were considered more effective and doing assignments less effective than they were initially expected to be. This change may be due either to the competence and charisma of the lectures or to the fact that all of us at the beginning of a course intend to work ever so hard at the assignments, but when it comes to the crunch we do not in fact labour as hard as we had hoped to; then, in order to avoid "cognitive dissonance" (psychological term for a "bad conscience"!) we assure ourselves that the assignments were not so important after all.

Table 20. Percentages of students selecting various means of learning as the one from which they expected to learn most and as the one from which they actually learned most.

	ROC		Day	
	Expected %	Actual %	Expected %	Actual %
Listening to radio	28	35	0	0
Attending class lectures	4	0	68	82
Doing assignments	37	27	18	11
Reading assigned books	16	27	2	0
Attending study weekends	6	7	--	--
Watching television	6	2	2	0
Talking with students	4	2	5	5
Talking with instructor	0	0	5	0
Reading supplementary books	0	2	0	2
Base	51	55	44	44

[1]The writer was not involved personally in the project at this stage.

Table 20 should not, however, be taken as an indicator of the overall importance of the various means of learning. It is fairly obvious that there is a high correlation between expectation and outcome with regard to first choices. The expectations had the nature of self-fulfilling prophecies: if you expect to learn best in one particular way, you will probably later perceive that way as having helped most.

A more valid index is given by Table 21, which takes account of more information than Table 20, in that it gives percentages of students selecting each means of learning as any of their three choices.

Table 21. Percentages of students selecting various means of learning as being among the three from which they actually learned most and among the three from which they expected to learn most.

	Actual		Expected	
	ROC %	Day %	ROC %	Day %
Listening to lectures	77	100	79	97
Reading assigned books	73	45	47	35
Doing assignments	56	85	73	68
Attending study weekends	44	--	47	--
Talking with instructors	15	17	24	32
Reading optional books	11	10	9	18
Talking with students	7	40	8	34
Watching television	7	2	13	7
Base	51	55	44	44

Table 21 shows that ROC students found that reading assigned books was second only to listening to lectures in usefulness. This was not in accord with their expectations, because they had thought that doing assignments would be the second most useful means of learning. Their expectations were shared by Day students, who indeed did believe that reading was a poor third to doing assignments. The only other seeming major difference between the two groups lies in the importance attributed by the Day students to discussion with each other, but if attending study weekends is equated with talking with other students, even that difference is ironed out.

A more detailed analysis of the relative perceived value of the various ROC course components is given in Table 22. From this, it is evident that there was a clear distinction in students' minds about the greater value of radio broadcasts which dealt with theoretical matters as compared with television programs and the so-called application broadcasts in which examples were given of the various theories. It may be that because so many students had experience with children, they could think of valid exemplifications for themselves. Had the course been on some other topic, the importance assigned to the presentation of theories in radio lectures and the workbook might have been less, and the value of television programs and the radio interviews in which experts discussed applications might have been deemed greater.

Table 22. Percentages of ROC students rating each course component as (A) 'extremely valuable' and as (B) 'not very valuable' or 'valueless'.

	(A)	(B)
Assigned reading	74	2
Radio theory presentation	71	2
Study weekends	64	5
Theory outline (in workbook)	59	14
Tutor's comments on assignments	51	11
Conversation with tutor	42	7
Television programs	38	9
Assignment feedback on radio	37	30
Radio application broadcasts (interviews)	30	11
Optional reading	29	13
Studio discussions and radio open line	18	23

Although 9% of students claimed they had no conversations with tutors, about half of the respondents thought the tutors' comments on assignments and their conversations were extremely valuable. Only one student in 10 thought the tutors of little or no value. So, despite their expense, it would probably be unwise to try to economise on tutors in running a multi-media course, say by introducing computerized tests instead of essay-type assignments. The popularity of study week-ends is also probably indicative

of the human desire to talk with one's own tutor. (Here, one might take note of the situation which occurred when a member of the Utilization Branch volunteered to organize a Saturday seminar for non-registered viewers of OECA's television course on communication: about 60 people said they would come but only about six did so-probably because they felt no human bond such as there is between a student and the tutor with whom one communicates regularly.)

Two other remarks should be made about Table 22. First, it does not reveal the fact that nobody considered the television programs useless: most students rated them simply 'valuable'. The Table does however make clear that, despite the improvements in the radio open-line noted in Appendix C, this component was still not highly esteemed. We shall consider later how broadcast feed-back might be improved.

11. Hours of Study

In the report on the previous year's ROC Introductory Sociology Course, attention was drawn to the fact that the 14-or-so hours' work which a student had to do each week in order to get a good grade drew a number of complaints. There was hardly any such grumbling by Developmental Psychology students, because the work-load was evidently less. The average hours of work were previously assessed by a diary method, but the Day school instructor protested that this would be troublesome for his students, so respondents were asked merely to estimate how much time they spent on various course components. It will be seen from Table 23 that the ROC estimate is down to less than 12 hours a week, and, as people tend to believe they work longer than they really do, the figure is probably inflated.

The Day students estimated that they gave little more than half the time that their ROC counterparts gave to the course, and this doubtless accounts for most of ROC's superiority in the post-test on knowledge, though the fact that many ROC students had children, whereas only one Day student was a mother, probably had something to do with the matter also.

Table 24 shows that there is no significant correlation between the amount of work Day students did and their knowledge scores toward the end of the course. This phenomenon may be explained by the interaction of two sets of conflicting tendencies: brighter students may work longer because they do not find it so much a strain as an enjoyable experience, but some of them will work less because their intelligence helps them to learn quickly; less intelligent students may work shorter hours because they find the necessary concentration too demanding, or they may work longer because that is the only way they can keep up with the course. Evidence of such conflict was noted in the final grades of the ROC Introductory Sociology Course.

Table 23. Average estimated numbers of hours spent each week on various aspects of course.

	Mean Hours	Standard Deviation
ROC		
Listening to radio lectures	2.59	0.99
Preparing assignments, etc.	4.37	3.89
Assigned reading	4.37	4.57
Watching TV	0.50	0.33
Total	11.84	8.12
Day		
Listening to class lectures	2.87	0.40
Preparing assignments, etc.	2.62	4.83
Assigned reading	1.05	0.93
Total	6.54	4.98

Table 24. Correlations between Day students' post-test knowledge scores, percentage improvements and weekly numbers of hours of study.

	Class Lecture Hours	Assigned Reading Hours	Assignment Preparation Hours	Total Study Hours
Post-test scores	.22	-.17	.02	.00
Percentage improvements	.15	-.08	-.09	-.09

The degree of improvement shown by Day students' post-test scores over their pre-test scores is, also according to Table 24, not significantly related to their hours of study. This is precisely what one would expect if I were correct in my earlier argument that Day pre-test scores were achieved largely by guesswork and the use of stratagems, because the improvement rates would then have a random distribution among the respondents.

The ROC post-test scores also show no significant correlation with work done, according to Table 25. Again, this is explicable by the conflicting tendencies hypothesis. On the other hand, there is a highly significant correlation between hours of study and the improvement of post-test over pre-test scores. This not only reinforces my contention that ROC pre-test scores were genuine indicators of knowledge, unlike the Day scores, but also the argument that the more knowledge a student had in the first place, the harder it was to show the same relative improvement as an initially less knowledgeable student. Therefore, both bright and comparatively dull students would have to work hard to show much improvement.

Table 25. Correlations between ROC students' post-test knowledge scores, percentage improvements and weekly numbers of hours of study.

	Television Viewing Hours	Radio Listening HOurs	Assigned Reading Hours	Assignment Preparation Hours	Total Study Hours
Post-test scores	-.13	.00	-.17	-.11	-.15
Percentage improvements	.05	.07	.36**	.23*	.33**
Assignment prep'n hours	.29*	.12	.68***		
Ass'd reading hours	.29*	.23*			
Radio listening hours	.04				

***Significant at 0.1% level **at 1% level *at 5% level

The amount of time spent on assigned reading appears to be the most important determinant of improvement, but it must be noted that the longer a student spent reading, the more likely he was to spend more time on viewing the television programs and on preparing assignments and undertaking other course-related activities such as optional reading. The reason why television-viewing and listening to the radio lectures appear to be unrelated to improvement is that nearly all students estimated that they spent much the same amount of time attending to the broadcasts, as is demonstrated by the smallness of the relevant standard deviations cited in Table 23. We shall see shortly that time spent on attending to broadcasts was in fact important.

12. Importance of Broadcasts and Readings

Although few ROC students were dependent upon cable facilities for hearing the FM radio broadcasts, about two-thirds of them used cable for the reception of television broadcasts. This appears from Table 26, which also shows that Channel 19 broadcasts were received by many more students than received either Channels 9 or 11. The reason for this lies not in the relative ease of receiving good signals from the various originating stations but in the fact that the Channel 19 broadcasts were on Sunday afternoons, whereas the other two channels broadcast the repeats on weekday mornings when it was not so convenient to watch.

Table 26. Percentages of ROC students having various means of access to electronic media.

	%	Base		%
Radio facilities				
FM antenna	79			
Cable	2	58		
Both	19			
Television facilities				
UHF antenna	33			
Cable	61	52		
Both	6			
Black and white	57			
Colour	36	56		
Both	7			
Channel 19 received	60			
Channel 9 received	43			
Channel 11 received	36	58*		
No TV facilities	5			
			19 only	38
			9 only	19
			11 only	12
			19+ 9	3.5
			19+11	2
			9+11	3.5
			All	17
			No TV	5

*Percentages on left sum to more than 100 because of multi-channel reception capabilities detailed on right.

One hour a day was the median time spent viewing television programs of all kinds by ROC students who were not employed: the median for part-time workers was about three-quarters of an hour, but for full-time workers it was twice as long, though Table 27 shows that the distribution of their viewing times is bimodal, that is to say, about a third of full-time workers viewed very little while the rest viewed from one to four hours a day. This pattern is not greatly different from Canadian norms.

Table 27. Percentages of ROC students viewing television for various estimated numbers of hours daily, tabulated by employment.

	All ROC Students %	Not Employed %	Part Time %	Full Time %
Do not view	4	4	0	5
Less than half an hour	18	15	13	23
Less than one hour	23	31	50	5
Less than two hours	36	31	25	46
Less than three hours	14	12	13	18
Less than four hours	5	7	0	5
Base	56			

ROC students spent a median of two hours a day listening to radio which contrasts with the median of 20 minutes a day of conscious listening found in Statistics Canada's 1972 Survey of Leisure-Time Activities. Table 28 shows that students employed full-time were slightly below the median, and the non-employed slightly above, but the differences were trival.

It is interesting to see these media-viewing patterns cropping up again in behaviour towards the broadcast components of the course. Table 29 shows that part-time workers saw fewer television programs than their colleagues, and again there was a minority of full-time workers who viewed very little. Also, full-time workers heard fewer radio programs than the average for all ROC students, while those not employed heard slightly more than the average, but the differences were again comparatively small.

Table 28. Percentages of ROC students listening to radio for various estimated numbers of hours daily, tabulated by employment.

	All ROC Students %	Not Employed %	Part Time %	Full Time %
Less than half an hour	12	15	0	14
Less than one hour	9	4	0	18
Less than two hours	29	23	50	27
Less than three hours	25	31	37	14
Less than four hours	7	8	0	9
Less than five hours	9	8	0	14
Five or more hours	9	11	13	4
Base	56			

Table 29. Percentages of ROC students hearing various proportions of course broadcasts, tabulated by employment at start of course.

	All ROC %	Not Employed %	Part Time %	Full Time %
Television programs seen				
All or nearly all	59	67	38	57
Most	26	18	38	30
About half	3	4	12	0
Less than half	3	4	0	4
Hardly any	9	7	12	9
Radio programs heard				
All or nearly all	86	96	88	74
Most	10	4	12	17
About half	3	0	0	9

A different pattern emerges with regard to amounts of reading done. Most of those not employed did nearly all the assigned reading, but few did even half of the optional reading, as can be seen from Table 30.

Table 30. Percentages of ROC students doing various proportions of assigned and optional reading tabulated by employment at start of course.

	All ROC %	Not Employed %	Part Time %	Full Time %
Assigned reading done				
All or nearly all	68	82	43	61
Most	19	7	29	30
About half	9	7	29	4
Less than half	4	4	0	4
Optional reading done				
All or nearly all	5	0	0	13
Most	16	11	25	17
About half	17	11	25	22
Less than half	33	48	13	22
Hardly any	26	30	25	22
None	3	0	13	4

Part-time workers did much less assigned reading than the other students although half of them read half or more of the optional material. But full-time workers did almost as much assigned reading as the non-employed and more optional reading than anyone else. It is reasonable to speculate that workers find it easier to get to libraries and bookshops than the non-employed, who tend to stay home more; one may guess that part-time workers may find it hard to set up regular routines for getting through the assigned books; but one inference which it really does seem safe to make is that workers did as much reading as possible to make up for missing a number of radio and television broadcasts.

The value of doing the assigned reading was apparent from the correlations in Table 25. The situation is dramatised by Table 31, which shows that students who did less than half the assigned readings scored very poorly indeed on the knowledge test, though these scores showed very little relation to the amount of optional reading done: it was therefore most unwise for many part-time students to do a reasonable amount of optional reading but skip much of the assigned material.

Table 31. Mean post-test scores of ROC students tabulated by proportion of television broadcasts seen, radio programs heard and reading done.

	TV Programs	Radio Programs	Assigned Reading	Optional Reading
All or nearly all	30.09	29.66	30.23	26.33
Most or about half	28.12	26.38	28.44	28.00
Less than half or hardly any	27.57	-	19.50	30.80
None	-	-	-	23.50

Table 31 also shows clearly that the more television and radio programs a student attended to, the greater the amount of knowledge she acquired (a fact which does not show up in the correlations in Table 25 for reasons already explained).

It is also worthy of note that the more time people spent every day listening to the radio, the less they were likely to learn from the course according to Table 32. It is clearer still that the more television a student watched each day the poorer her final knowledge score would probably be. A liking for the media is evidently no prognosticator of success in a media-based course!

Table 32. Mean post-test scores of ROC students tabulated by daily hours of television-viewing and radio-listening.

	TV	Radio
Do not view	32.50	-
Less than half an hour	31.80	31.29
Less than one hour	28.54	29.40
Less than two hours	28.40	28.06
Less than four hours	27.54	29.72
Over four hours	-	27.30

13. Reactions to Broadcasts

The majority of students took notes on the radio programs: 61% of them gave their reasons for doing so, which are summarized in Table 33. All those who did not take notes felt it necessary to give their reasons, half of them saying they tape-recorded the programs--in other words they took recordings to be substitutes for notes, whereas a third of those who did make notes did so from recordings.

Table 33. Percentages of ROC students taking and not taking notes on radio programs, and their reasons.

	%	%	
Taking a lot of notes	41		
Taking a few notes	43		
			Base
For reference, assignments		54	
Reinforces lessons		13	61%
Tape recorded program		33	
No notes taken	16		
			Base
Tape recorded program		45	
Instructor goes too quickly		22	100%
Have read textbooks		22	
Matter not technical		11	

Only half the students took notes on the television programs. Those who did not stated that watching precluded note-taking, among other reasons summarized in Table 34.

Whatever students' reasons or rationalizations might have been, there is a clear tendency for takers of a few notes to do best, followed by those who took no notes at all, with the compulsive note-takers showing the smallest post-test knowledge scores. The figures are given in Table 35, and though the differences are too small to be statistically significant, it would seem worthwhile to let them be known to future students of media-based courses; they should be told to take enough notes to trigger their memories and no more. It is obvious that some students thought voluminous

note-books to be virtuous in themselves. If techniques of study had been more fully explained in the workbook or at the Orientation Day at the start of the course, many students might have saved themselves effort and disappointment at the small fruits of all their labour.

Table 34. Percentages of ROC students taking and not taking notes on television programs, and their reasons.

	%	%	
Taking a lot of notes	14		
Taking few notes	36		
			Base
For reference, assignments		60	36%
Reinforces lessons		40	
No notes taken	50		
			Base
Can't write and watch		41	
Picture vivid enough		18	
Not necessary		18	61%
Did not see programs		18	
Never thought of note-taking		6	
Base	56		

Table 35. Mean post-test scores of ROC students tabulated by amount of note-taking on broadcasts.

	TV	Radio
Few notes	29.90	29.60
No notes	29.11	29.00
Lots of notes	27.25	28.88

Another set of statistics which might be drawn to students' attention is given in Table 36. It shows that students who received the television broadcasts on several channels, that is to say those who watched the same program more than once, gained higher knowledge scores than those who received only one channel. To the objection that the students with no television facilities did very well, it must be countered that they did actually get to other people's sets and watched all or most of the programs. The few non-viewers were people who had television sets in their homes and could have received the broadcasts had they wished to.

Table 36. Mean post-test scores of ROC students tabulated by access to television broadcasts.

Reception on only one channel	28.30
Reception on two or three channels	33.23
No television facilities	32.33

Both in the open-ended and the final, more formal questionnaire, efforts were made to elicit students' comments about the individual televised films they had seen, but hardly anyone accepted either invitation. It may be that they could have recalled the films but not always from the title: it is perhaps significant that the two films with the lowest average ratings had very similar titles, 'The Game' and 'All in the Game'. Also in the final questionnaire, as a check, two films were listed which had then still not been broadcast, yet five people offered comments on them, varying from 'good' to 'terrible'. For whatever it is worth, Table 37 gives the ratings for each film. The two most popular, 'Shyness' and 'Jamie', were highly emotive: it was difficult for some students to find a form of words which would have enabled them to remember the message of those programs: they felt that some kind of commentary should have been provided for the films with an emotional or entertaining approach. At the other extreme were films which were primarily didactic, namely, 'Embryology of Human Behaviour' and 'Growth of Love', which were well organized but which some students found tedious, particularly because of the phrasing of the narrative. Another kind of complaint was that some films were too glib in comparision to the complexity of the problems with which they dealt. Yet another problem arose when the films had an ethos different from that of the course: one respondent wrote, regarding 'Conscience of a Child', that "I question the methodology and disagree with the conclusions...it strongly needed comments from the point of view...the course is trying to put forward"; it seems that the respondent

was decrying a different dogma, and that more effort should have been expended in getting students to understand that different approaches may have equal validity, or at least that they should be evaluated rationally rather than emotionally.

Table 37. Percentages of ROC students giving various ratings to television programs.

	Excellent	Good	Fair	Poor	Terrible	Not Seen, No Response
Shyness	57	10	5	3	0	24
Jamie, The Story of a Sibling	36	26	12	2	0	24
Learning to Learn	36	24	10	0	2	28
Growth of Love	28	31	7	0	2	33
Embryology of Human Behaviour	28	29	10	0	2	31
Conscience of a Child	26	35	16	3	3	17
Introduction to the Course	22	52	7	0	0	19
All in the Game	17	35	14	0	2	32
The Game	14	28	12	3	3	40

14. Innovations Desired

The remarks about the televised films lead to the conclusion that there should be more discussion of the programs. Asked whether they would like more such discussion, 83% of the total sample answered 'Yes'. As for the preferred medium of such discussions, Table 38 shows that television received the most votes. It would seem logical to have a televised open-line discussion following the televising of a film. On the other hand, students do not seem to be as keen on television as they are on radio as a general medium for discussion, as Table 39 shows. The unpopularity of television as a general discussion medium can be easily explained. It is not that students do not want to see each other and the

instructors on the screen, but that they are afraid they might be called upon to go to a studio and talk to the cyclopean eye of a television camera while they sit under blinding lights which reveal every squirm of their discomforture. There is no other way to account for the data on preferred media for student participation in discussions given in Table 40.

Table 38. Percentages of ROC students who would like more discussions of television programs and their preferred media*

	%	
Discussions wanted on -		
- Television	21	(44%)
- Radio	14	(40%)
- Study Weekends	15	(34%)
- TV and Radio	14	
- TV and Weekends	7	
- Radio and Weekends	10	
- All three media	2	
Indifferent	17	

*Figures in parentheses are obtained by summing all choices in which the relevant medium is mentioned.

Table 39. Percentages of ROC students preferring radio or television for student discussion programs.

	%
Radio only	40
Television only	12
Both	29
Indifferent	19

Table 40. Percentages of ROC students who would like to participate in a broadcast discussion.

	%
On radio only	43
On radio and television	10
On television only	0
Would not like to participate	47

Another popular innovation would be the provision of a summary of television broadcasts. The workbook provided outlines of the radio theory lectures, but, as Table 41 shows, a third of the students would have liked a summary at the end of every broadcast, either as a substitute for or in addition to material in the workbook.

Table 41. Percentages of ROC students wanting a summary of each radio and television broadcast.

	%
Summary wanted in workbook	52
Summary wanted at end of program	12
Summary wanted in both forms	19
No Summary wanted	12
Uncertain	5

ROC students were asked to state the most convenient times and days for them to attend to television and radio broadcasts. Their responses, analyzed in detail in Appendix E, show little concensus, though the times of the radio broadcasts actually scheduled for the course were very popular.

As remarked earlier, weekday rebroadcasts at times when most people were just starting their day's work did little to increase viewership of the television programs, but neither was there great enthusiasm for CICA's choice of time for the original broadcast, after lunch on Sunday.

Because both radio and television programs demand concentration, it seems reasonable to suppose that a time selected as suitable for attending to one medium would be almost equally suitable for attending to the other. Therefore, the separate numerical distributions of choices of times for television and for radio broadcasts, given in Appendix E have been combined and their presentation simplified in Table 42. From this it seems that broadcast times for a media-based course should be selected from the following list:

After supper, Mondays to Thursdays
After lunch, Mondays to Wednesdays
Before or just after Sunday lunch

Table 42. Broadcasting times most desired by ROC students.

Half-Hour Starting:	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
9:00 a.m.	*						
9:30 a.m.	*	*					
11:30 a.m.							*
12:00 noon							*
12:30 p.m.							*
1:00 p.m.							*
1:30 p.m.	**	*	**	*	*		*
2:00 p.m.	*	*	**				*
2:30 p.m.							*
7:30 p.m.	*	*	*	*		*	
8:00 p.m.	*	*	*	*		*	
8:30 p.m.	*	*	*	*		*	
9:00 p.m.	**	*	**	*		*	*
9:30 p.m.	**	*	**	*			*

*Half hour selected by at least an eighth of respondents.
**Half hour selected by at least a quarter of respondents.

One solution to the problem of finding broadcast times suitable to all potential students is to abandon the fruitless search and offer them the opportunity of borrowing tape recordings of the programs. Table 43 shows that just half of those not employed would welcome the chance to hear audio-tapes at home and to see video-tapes in some local library or school. Even among the employed, the proportion who would like to borrow recordings is only 70%. It seems fairly clear that tapes would be used by a sizeable minority if they could be obtained, but that tapes would not be acceptable as a substitute for broadcasting.

Table 43. Percentages of ROC students responding to questions on borrowing recordings of course broadcasts, tabulated by employment.

	All ROC %	Not Employed %	Part Time %	Full Time %
'Would you like to be able to borrow audio-tapes of the radio programs to listen to in your home?'				
Yes	62	50	63	77
No	27	35	25	18
Uncertain	11	15	12	5
Base	56			
'Would you like to be able to borrow video-tapes of the television programs and view them in your local library or school?'				
Yes	58	50	86	59
No	18	19	0	23
Uncertain	24	31	14	18
Base	55			

One strongly felt need among ROC students is for more guided discussion. Many are too shy to use the open-line, which anyhow does not give the same close rapport as face-to-face discussion can. It is difficult to be sure how many could or would actually come to discussion groups held locally on a regular basis to discuss the course content, but three-quarters of the students, regardless of employment, say they would.

As Table 44 shows, monthly meetings are more likely to be attended regularly than weekly ones.

Table 44. Percentages of ROC students giving various estimated frequencies with which they would attend discussion groups if they met locally, tabulated by employment at start of course.

	All ROC %	Not Employed %	Part Time %	Full Time %
Once a week	28	30	25	26
Once a month	50	48	50	52
Occasionally	22	22	25	22
Never	0	0	0	0

15. Benefits and Disadvantages

The grade distribution for ROC students was almost the same as in the previous year's Introductory Sociology course. Table 45 shows that twice as many A grades were awarded to ROC students as to Day students, which seems quite fair in view of the knowledge post-test score distributions. It was explained in the evaluation of the previous course that students tended to drop out if they sensed that they would not do well. This seems to have happened again, though the dropout rate was down. It may still be considered that for 40% of the original enrollment to drop-out was excessive, but that figure appears less objectionable when it is noted that the Day school course, which was less time-consuming and which formed part of a student's chosen program, suffered a 17% dropout rate.

ROC students were asked to rate four advantages of a media-based course which were often mentioned in response to the open-ended questionnaire. The results given in Table 46 indicate that all four advantages were seen as important, though the fact that fully-employed people gave so little importance to the advantage of listening in one's own home, which was rated as most important by the majority of their colleagues, suggests that a number of full-time employees listened to the radio program while they were at work.

Table 45. Percentage grade distributions of original enrollment and students graded at end of course.

	ROC		Day	
	Original Enrollment %	Graded Students %	Original Enrollment %	Graded Students %
A	17	32	13	15
B	25	46	40	48
C	11	20	23	28
D	1	1	7	8
Fail	0	0	1	1
Incomplete	7		0	
Dropouts	40		17	
Base	174		101	

Table 46. Percentages of all ROC students rating given advantages of a radio-television course as most and as least important (with percentages for students employed full-time in parentheses).

	Most Important %	Least Important %
Being able to listen day or night	29 (27)	19
Ease and comfort of listening in one's own home	31 (14)	30
Being able to listen to a lecture more than once	19 (33)	18
No waste of time travelling to a lecture hall	21 (25)	33
Base	56	

About two-thirds of students cited other advantages which were not mentioned in the questionnaire (see Table 47).

Table 47. Percentages of ROC students listing advantages of a radio-television course.

	%
Convenience of being able to tape-record, so lectures not missed when ill or unable to leave home	17
Flexibility of study, with choice of broadcasts, being able to work at one's own speed, or study during shift work	16
Privacy, liking working alone, having a good environment for concentration, being able to think after lectures	14
No baby-sitting problems	9
Promoting self-reliance	7
Economy	2
Miscellaneous, already listed in questionnaire	10
No response	25

ROC students were also asked to rate the disadvantages of a media-based course: an exceptionally large proportion, 15%, failed to respond, perhaps indicating that they did not consider any of the listed disadvantages at all serious. The most serious problem for the majority of those who did respond, as Table 48 makes clear, was having to try to attend to broadcasts while coping with distractions at home, but for the fully-employed this took third place in seriousness, again suggesting that they listened to radio lectures while at work. Being unable to question the instructor immediately was the second worst problem for most people, but having little say in designing the course worried very few. About a quarter of the respondents deemed that having no other students to talk to was their worst problem, so the possibility of organizing local discussion groups or regular conference telephone calls should be examined if media-based courses are considered in the future.

Table 48. Percentages of ROC students rating given disadvantages of a radio-television course as most and as least serious.

	Most Serious %	Least Serious %
Having to accept what the instructor says without being able to question him immediately	30	8
Having to cope with distractions at home while listening to radio or television broadcasts	32	17
Having no other students to talk things over with	23	23
Having little opportunity to make suggestions regarding the design of the course	15	52
Base	51	

Students were asked to list other disadvantages of a media-based course, but it can be seen from Table 49 that, in addition to non-respondents, there were many who cited only disadvantages that were already mentioned in different words in the questionnaire itself, and even a large minority wrote specifically that there were no other disadvantages. Thus, there remained only 17% with complaints of their own.

The chief reason given by the majority of students for enrolling in the ROC course was that they enjoyed learning: and that was the chief benefit they derived, as is shown by Table 50. (Note that the methodological critique given of Tables 20 and 21 applies with equal force to Tables 50 and 51.) A specific interest in psychology was, in general, only a secondary reason for the enrollment of students with ROC, which was offering no other subject for study. For Day students, the situation was different: the majority gave interest in psychology as their chief reason for enrolling, but self-understanding was selected by the majority as the greatest benefit they actually gained from their course, which perhaps indicates that it was adjusted to meet the special needs of people somewhat less mature than those enrolled with ROC.

Table 49. Percentages of ROC students listing disadvantages of a radio-television course.

	%
Can't see lecturer, no interaction, difficulties with ambiguities*	17
Poor broadcast reception	7
Hard to concentrate at home, takes self-discipline*	5
Miss other students*	5
Not enough time on each subject	2
Lack of guidance on essays, etc.	2
Time of tutor's call unsuitable	2
Credits not accepted elsewhere	2
Ivory tower situation	2
No disadvantages	17
No response	39

*Problems already listed in questionnaire.

Table 50. Percentages of students selecting various phrases as their main reason for enrolling and as the greatest benefit they gained.

	ROC		Day	
	Reason	Benefit	Reason	Benefit
Enjoyment of learning	36	40	11	18
Interest in psychology	24	24	60	16
Help in present job	13	9	0	2
Course credit	9	11	9	16
Self-understanding	7	9	9	44
Help to get better job	4	2	7	2
Understanding others	4	0	4	2
Interest in media-based course	2	4	-	-
Base	56	55	45	45

When the three main benefits gained by each student are amalgamated, as in Table 51, it can be seen that, for both ROC and Day students, the benefits they gained matched their reasons for enrolling remarkably closely, except that the course proved less likely to be helpful in getting another job than they expected, and it did give both ROC as well as Day students more self-understanding than they anticipated.

Table 51. Percentages of students selecting various phrases as being among the three greatest benefits they gained and among their three main reasons for enrolling.

	Benefit gained		Reason for Enrolling	
	ROC %	Day %	ROC %	Day %
Enjoyment of learning	72	57	72	47
Interest in psychology	63	92	66	96
Course credit	55	43	58	43
Self-understanding	48	74	26	56
Help in present job	29	7	27	2
Interest in media-based course	17	--	16	--
Help to get better job	7	18	22	32
Understanding others	6	9	7	18
Base	55	45	56	45

In fact, three-quarters of the ROC students claimed some sort of personal change had been effected in them by the course. Table 52 gives the details, but the reader can get a rather better feel for the students' attitudes from the section of Appendix C entitled 'Open-College Concept'. It seems clear that there are a number of women who are effectively debarred from higher educational experiences by feelings that, after years out of school, they would never be able to cope with systematic instruction, or beliefs that their only place is in the home looking after the needs of the family. Doing a course through ROC opens their eyes to

their own potential and makes them realize that difficulties in adhering to a routine of study are not insurmountable. Thus they may be encouraged to take advantage of other educational facilities which would have been unthinkable to them without a challenging media-based course to start on.

Table 52. Percentages of ROC students claiming course changed their views or behaviour.

	%	%
Changed	78	
Better understanding of children		32
Better understanding of self and others		28
Widened horizon, more tolerence		28
More confidence		5
Miscellaneous		7
Not changed	15	
Uncertain	7	

The pleasure and help which the students gained from the course can be gauged from Table 53 which summarizes the additional comments that they made in the final questionnaire. It shows that for every criticism or suggestion there were two congratulations.

16. Recommendations

In the development of any multi-media course, the following recommendations may deserve consideration. They also will serve as a partial summary of the present study.

[1] Ryerson Open College courses are not being offered in 1973-74.

Table 53. Percentages of ROC students making additional comments in final questionnaire.

	%	%
Congratulatory remarks		
Course was valuable, interesting, should be available to more people	40	
Course checked on ability to study	2	44
Course not impersonal	2	
Criticisms and suggestions		
Evening discussions would help	5	
Times unsuitable, TV programs too early	3	
Study groups need tutor as leader	3	19
Assignments not clear	2	
Tutor's comments not legible	2	
Too much material	2	
Dislike home study	2	
No comment		37

As far as possible, the content of media-based courses should be related to the probable life experiences of mature students. The ROC Developmental Psychology course was largely a success because so many students were mothers who could fit their knowledge of children into the conceptual framework provided.

Because they proved the most helpful, the following course components should be considered essential: radio lectures on theory, books for assigned reading, study week-ends, and a workbook containing outlines of theory and instructions for assignments.

Televised films would have been more valuable had each been followed by a discussion to emphasize the points which the films were supposed to illustrate.

Every broadcast should be summarized at the end of the program, or in the workbook, or both.

Students should be told to take a few notes on every program. Too many are worse than none at all.

Students should be told that there is some evidence that televised films assist learning if they are seen more than once. It is certainly helpful to hear a radio lecture repeated.

The least inconvenient periods during which students could attend to course broadcasts are: 7:30 to 10:00 p.m. Monday through Thursday; 1:30 to 2:30 p.m. Monday through Wednesday; and Sunday 11:30 a.m. to 3:00 p.m.

Consideration should be given to the possibility of lending tape recordings of radio programs to students for home listening, and for enabling them to view video-tapes of television programs at local libraries or schools, in case they have difficulty in receiving broadcasts at home.

It might prove worthwhile to encourage students to hold monthly discussions in their locality, or to organize telephone conference calls, to review course content, preferably with a tutor leading the discussion.

Not many students should be expected to join in televised discussions as most of them seem afraid of appearing before a TV camera.

Tutors provide a much-needed human contact for each student, but there should be a means whereby each tutor's contribution could be evaluated.

Students should be fully advised on how best to allocate their study time. Employed students learned less than their stay-at-home colleagues, partly because they gave a disproportionate time to optional reading, at the expense of more essential course components.

Students who have not completed Grade 12 or 13 should be advised that they may find it more difficult to learn in a media-based credit course than those with more education.

Students with some post-secondary education should be made aware of the high standards expected of them in the course, and warned that some of their predecessors have fared surprisingly poorly.

A high proportion of A and B final grades and a dropout rate of up to 50% should be expected, as adults who feel they are doing badly prefer to quit rather than be failed. However, even the dropouts may get a valuable educational experience.

Teachers, social workers and people in similar professions should not be discouraged from taking a media-based course; such people generally appear to be interested in enrolling only if they are so acutely aware of deficiencies in their education that they are unwilling to expose themselves to a classroom situation until they have gained confidence by home study.

APPENDIX A

Sample Questionnaires

The following pair of questionnaires was administered to ROC students at the Orientation Day during the second week of the Developmental Psychology course and at the Study Weekend just before the course's nineteenth week. Abbreviated forms of the questionnaires were administered at corresponding times to Day students; only the first 16 questions of the first questionnaire and only Questions 1, 2, 5 and 6 of the second were asked of Day students; in the second questionnaire they were also asked "In an average week, how many hours did you spend attending class lectures in the Developmental Psychology course?" In the second questionnaire, Question 2 omitted mention of the study weekends in the form administered to Day students, but they were asked about the value of radio listening and television viewing in case they decided to supplement their course by attending to the broadcasts. Originally, it had been intended to ask all students to keep a diary recording of all their course-related activities. However, the Day school instructor objected that this would put too great a demand on his students at a time when they were preparing for their final tests. It was therefore necessary to ask students their estimates of their average weekly time budgets. So to avoid inflation of the Day students' estimates and to avoid suggesting to them that the broadcasts were a valuable source of learning, they were not specifically asked to estimate time spent attending to the broadcasts: however, it will be noted that such time would be accounted for in response to the question concerning time spent on preparing assignments and other work related to the course.

There were only trivial differences between the covering letters to the Day and ROC students.

No._____

The Ontario Educational Communications Authority

Research and Development Branch

and

Ryerson Open College

January 1973

Developmental Psychology Evaluation Project

This questionnaire is part of a research project comparing the Developmental Psychology course, as it is given in the classroom by an instructor who meets the students face to face, with the same course given via radio and television through Ryerson Open College.

First we ask you some questions about you, your experience, and your expectations for the course. Then we ask you questions on the content of the course.

Please be assured that your answers will be kept strictly confidential. They have nothing whatsoever to do with your marks in the course. You need not participate if you do not wish, but we hope you will be interested in assisting in this important research.

Before turning to the questions, please fill in the form below. It is required for our records only. This sheet will be removed from the questionnaire as soon as it is received, and your responses will be identified only by number.

Thank you for your co-operation.

NAME_____

LOCAL ADDRESS_____

_____

_____

No. _____

SECTION A

(PLEASE CIRCLE THE APPROPRIATE RESPONSE)

for example: Yes 1

No . . . . . (2)

1. Have you taken any courses previously in psychology?

Yes 1

No. 2

If yes, please list these:

_____

_____

_____

2. When did you last take a course for credit?

_____

3. Have you taken the Introductory Sociology course through the Ryerson Open College?

Yes 1

No. 2

4. Are you presently employed?

No. 1

Yes (part time) 2

Yes (full time) 3

5. What kind of work do you do (or did you do in your last occupation)?

_____

_____

6. Do you work:

Days 1

Evenings 2

Nights 3

Alternating shifts?. 4

7. Do you work with children at the present time?

Yes. 1

No 2

If yes, please specify _____

_____

_____

8. Have you worked with children in the past?

Yes. 1

No 2

If yes, please specify _____

_____

_____

9. Do you have children of your own?

Yes. 1

No 2

If yes, please indicate the number of children living at home _____

No._____

10. Think of the reasons which were in your mind when you made the decision to enrol in this course. In the following list please check the three reasons you feel are most important. Mark your choices one, two and three, in the space on the right.

Order of Importance

I enjoy "learning" . . . . . ( )

Interested in or curious about the subject of psychology. . ( )

For credit. . . . . ( )

To help me in my present job. . . . . ( )

To help me get a better job in the future . . . . . ( )

To understand myself. . . . . ( )

Interested in taking a "media-based" course . . . . . ( )

Other (specify) . . . . . ( )

11. Of the following statements please check the three that most nearly fit your expectations. Mark your choices, one, two and three.

I anticipate I will learn more from:. . . . . ( )

Reading assigned books. . . . . ( )

Doing assignments and receiving critical comments . . . . . ( )

Attending class lectures. . . . . ( )

Talking with other students informally about the course . . ( )

Talking with my tutor . . . . . ( )

Listening to radio. . . . . ( )

Watching television . . . . . ( )

Reading Supplementary (non-assigned) books . . . . . ( )

Attending the study week-ends . . . . . ( )

Other (specify) . . . . . ( )

No. _____

12. Which language did you first learn and still understand?

English 1

Other (please specify). 2

13. Are you:

Female. 1

Male. 2

14. In which of the following age groupings do you belong:

20 or under 1

21-30 2

31-40 3

41-50 4

51-60 5

Over 60 6

15. Is your place of residence: . . . .

Within Metropolitan Toronto 1

Within 30 miles from Metro. 2

30 to 50 miles from Metro 3

More than 50 miles from Metro . . . 4

16. What is the highest level of education you have successfully completed?

Less than Grade 8 1

Completed Grade 8 2

Completed Grade 9, 10 or 11 3

Completed Grade 12. 4

Completed Grade 13. 5

Some post-secondary 6

University degree 7

17. How many years of fulltime work experience have you had?

Less than 1 year. 1

1 to 2 years. 2

More than 2 but less than 5 3

5 to 10 years 4

More than 10 years. 5

18. Do you receive the radio broadcasts of "Developmental Psychology" on:

CJRT FM 91.1. 1

Cable 2

By both 3

19. Do you receive the TV broadcasts of "Developmental Psychology" on:

Channel 19. 1

Channel 11. 2

Channel 9 3

I do not have TV facilities 4*

*If you circled 4, skip to Question 24.

20. How do you receive the TV broadcasts of "Developmental Psychology":

By U.H.F. (i.e. not by cable) . . . 1

By Cable. 2

By both 3

21. Do you watch the TV broadcasts of "Developmental Psychology" on:

Black and White TV. 1

Colour TV 2

Both. 3

No. _____

22. How many hours a day, on an average do you watch television?

Less than ½ hr.. 1

At least ½ hr. but less than 1 hr. . 2

At least 1 hr. but less than 2 hrs.. 3

At least 2 hrs. but less than 3 hrs. 4

At least 3 hrs. but less than 4 hrs. 5

At least 4 hrs. but less than 5 hrs. 6

5 or more hrs. 7

I do not watch television. 8

23. How many hours a day, on an average do you listen to radio?

Less than ½ hr.. 1

At least ½ hr. but less than 1 hr. . 2

At least 1 hr. but less than 2 hrs.. 3

At least 2 hrs. but less than 3 hrs. 4

At least 3 hrs. but less than 4 hrs. 5

At least 4 hrs. but less than 5 hrs. 6

5 or more hrs. 7

I do not listen to radio 8

24. Please rank these four advantages in taking a credit course by radio/television in order of importance (4 = most important, 1 = least important)

Being able to listen day or night. .( )

No waste of time travelling to a lecture hall . . . . . .( )

Being able to listen to a lecture more than once . . . . . .( )

Ease and comfort of listening in one's own home . . . . . .( )

25. What other advantages do you think you may find in taking a credit course by radio/television:

_____

_____

_____

26. Please rank these four disadvantages in taking a credit course by radio/television in order of importance: (4 = most important, 1 = least important)

Having to cope with distractions at home while listening to radio/television broadcasts. . . . . .( )

Having no other students to talk things over with . . . . . .( )

Having to accept what the instructor says without being able to question him immediately . . . . . .( )

Having little opportunity to make suggestions regarding the design of the course. . . . . .( )

27. What other disadvantages do you think you may find in taking a credit course by radio/television?

_____

_____

_____

The Ontario Educational Communications Authority

Research and Development Branch

and

Ryerson Open College

May 1973

Developmental Psychology Evaluation Project

This questionnaire, in combination with the one we asked you to fill out previously, is crucial to a research project on the Developmental Psychology Course. The project compares the course as given in the classroom by an instructor who meets the students face to face, with the same course given via radio and television through Ryerson Open College.

Please be assured that your answers will be kept strictly confidential. They have nothing whatsoever to do with your marks in the course. You need not participate if you do not wish, but we hope you will be interested in assisting in this important research.

Before turning to the questions, please put your name in the space below. It is required for our records only. This sheet will be removed from the questionnaire as soon as it is received, and your response will be identified only by number.

Thank you for your co-operation.

NAME _____

NUMBER _____
(For office use only

 No._____

1. Please think of the benefits you expect to have gained from the course. In the following list please check the three benefits you feel are most important. Mark your choices 1, 2, and 3 in the space on the right.

Enjoyment of learning..... ( )

Satisfaction of interest in psychology..... ( )

Course credit..... ( )

Help in my present job..... ( )

Will help me get a better job in the future..... ( )

Self-understanding..... ( )

Satisfaction of interest in taking a "media-based" course..... ( )

Other (please specify)..... ( )

2. Of the following statements please check the three that most nearly describe your experience in the course. Mark your choices 1, 2, and 3.

I learned most from:

Reading assigned books..... ( )

Doing assignments and receiving critical comments..... ( )

Attending class lectures..... ( )

Talking with other students informally about the course..... ( )

Talking with my tutor..... ( )

Listening to radio..... ( )

Watching television..... ( )

Reading supplementary (non-assigned) books..... ( )

Attending the study week-ends..... ( )

Other (please specify)..... ( )

3. In an average week how many hours did you spend listening to radio in the Developmental Psychology Course?

_____hours

4. In an average week, how many hours did you spend watching television in the Developmental Psychology Course?

_____hours

5. In an average week how many hours did you spend on assigned reading for the Course?

_____hours

6. In an average week how many hours did you spend preparing assignments and other work related to the Course?

_____hours

7. How many of the radio programs in the Developmental Psychology Course did you listen to? (Please circle the number opposite the appropriate answer)

All or nearly all of them..... 1

Most..... 2

About half..... 3

Less than half..... 4

Hardly any..... 5

None..... 6

8. How many of the television programs did you watch?

All or nearly all..... 1

Most..... 2

About half..... 3

Less than half..... 4

Hardly any..... 5

None..... 6

9. How much of the assigned reading did you do?

All or nearly all..... 1

Most..... 2

About half..... 3

Less than half..... 4

Hardly any..... 5

None..... 6

No._____

10. How much of the optional reading did you do?

All or nearly all..... 1

Most..... 2

About half..... 3

Less than half..... 4

Hardly any..... 5

None..... 6

11. How valuable to your learning were the following components of the Developmental Psychology Course? *

	extremely valuable	quite valuable	not very valuable	valueless	I did not use this component
radio theory presentation (by course instructor)	1	2	3	4	5
radio application broadcasts (interviews with guests)	1	2	3	4	5
assignment feedback on radio	1	2	3	4	5
studio discussions and open line	1	2	3	4	5
television programs	1	2	3	4	5
theory outline (in workbook)	1	2	3	4	5
assigned reading	1	2	3	4	5
optional reading	1	2	3	4	5
tutor's comments on assignments	1	2	3	4	5
conversation with tutor	1	2	3	4	5
study weekends	1	2	3	4	5

*Please circle a number under each appropriate answer.

12. Please indicate your overall opinion of each television program.

	Excellent	Good	Fair	Poor	Terrible	I did not see this program	comments
All In The Game.....	1	2	3	4	5	6	
Conscience of a Child.....	1	2	3	4	5	6	
Embryology of Human Behaviour.....	1	2	3	4	5	6	
Growth of Love.....	1	2	3	4	5	6	
Introduction to the Course: Film Clips and Discussion involving Chisholm, King, Swede...	1	2	3	4	5	6	
Jamie, The Story of a Sibling.....	1	2	3	4	5	6	
Learning To Learn.....	1	2	3	4	5	6	
Shyness.....	1	2	3	4	5	6	
The Game.....	1	2	3	4	5	6	
Three Grandmothers.....	1	2	3	4	5	6	
What Do I Like About Tommy.....	1	2	3	4	5	6	

no. _____

13. Do you think this course has helped you change your views or behaviour?

Yes..... 1

No..... 2

Uncertain..... 3

If "Yes" in what way have you changed:

_____

_____

_____

_____

14. Would you prefer to have student discussion programs broadcast on: (Circle one or two)

Radio..... 2

Television..... 3

I am indifferent..... 1

15. Did you or would you have liked to participate in a broadcast discussion? (Circle one or two)

Yes, on radio..... 2

Yes, on television..... 3

No..... 1

(Circle one or two)

16. Would you like more discussions of TV programs? (Circle one or more)

Yes, on television..... 2

Yes, on radio..... 3

Yes, on study weekends..... 4

I am indifferent..... 1

17. Would you like a summary of the content of each radio and television broadcast? (Circle one or two)

Yes, at end of each program.... 3

Yes, printed in workbook..... 4

No..... 1

Uncertain..... 2

18. When are the most convenient days and times for you to listen to the radio broadcasts? (Please indicate from when to when, e.g. Monday 6 p.m. - 7:30 p.m.)

Monday _____

Tuesday _____

Wednesday _____

Thursday _____

Friday _____

Saturday _____

Sunday _____

NO._____

19. When would be the most convenient time for you to watch the television broadcasts? (Please indicate from when to when)

Monday_____

Tuesday_____

Wednesday_____

Thursday_____

Friday_____

Saturday_____

Sunday_____

20. Do you usually take notes on the radio programs you listen to for the course?

Yes, a few..... 1

Yes, a lot..... 2

No..... 3

Why?_____

_____

21. Do you usually take notes of the television programs you watch?

Yes, a few..... 1

Yes, a lot..... 2

No..... 3

Why?_____

_____

22. Would you like to be able to borrow audio-tapes of the radio programs to listen to in your home?

Yes..... 1

No..... 2

Uncertain..... 3

23. Would you like to be able to view video-tapes of the television programs in your local library or school?

Yes..... 1

No..... 2

Uncertain..... 3

24. If discussion groups met locally on a regular basis to discuss the course content, would you try to attend?

Once a week..... 1

Once a month..... 2

Occasionally..... 3

Never..... 4

25. Additional comments about the course

_____

_____

_____

_____

_____

APPENDIX B

Developmental Psychology Knowledge Test

The following multiple-choice test was appended to the questionnaires reproduced in the preceding appendix which were administered at the start and finish of both ROC and Day courses.

The test was devised by members of the ROC staff before the author of this report took over responsibility for evaluation of the Introductory Psychology course. He therefore cannot take responsibility for the fact that half the questions can be correctly answered by a strategy of selecting any choice of the form "all (or none) of the above". Of the 42 questions, 17 are correctly answered by the longest choice; of the nine "all" or "none" answers, five are correct. It should also be noted that question 34 offers only three choices.

The correct answers are underlined here.

No. _____

SECTION B

Do not be disappointed if you cannot answer most of the following questions. Circle the answer that seems most correct. Do not spend more than a minute on each question. If you don't know, make a guess.

1. Girls are more likely than boys to:

   a. be oriented to things.

   b. wet the bed.

   c. have reading disabilities.

   d. get better grades.

2. Boys are more likely than girls to:

   a. stutter.

   b. become delinquent.

   c. wet the bed.

   d. all of the above.

3. The following maternal experiences might affect prenatal development:

   a. electric shock.

   b. crowded living conditions.

   c. sudden exposure to cold.

   d. all of the above.

4. The most common way in which the environment influences prenatal development is through:

   a. the emotional state of the mother.

   b. abrupt changes in atmospheric conditions.

   c. massive doses of ionizing radiation.

   d. transmission of substances from the mother's bloodstream to the baby's via the placenta.

No. _____

5. The age at which the difference between barren and rich environments seems first to have an effect:

   a. is infancy.

   b. varies from culture to culture.

   c. is preschool years.

   d. is unknown

6. It is probably a good idea to allow little boys dramatic play with dolls:

   a. so they can get it out of their system.

   b. so they will know what it's like to be a father.

   c. To encourage the development of tenderness.

   d. to help in resolving the Oedipal complex.

7. Sex roles seem:

   a. primarily determined by sex hormones.

   b. entirely learned.

   c. partly learned.

   d. genetically determined.

8. The chief genetic determinant of maleness or femaleness is:

   a. hormonal secretions from the gonads.

   b. the presence or absence of a Y-chromosome.

   c. the number of X-chomosomes.

   d. hormonal secretions from the placenta.

9. The emotions shown by the newborn baby:

   a. range from contentment through neutrality to agitated distress.

   b. are fear, rage and love.

   c. prove that human beings are innately agressive.

   d. prove that sexuality is an intrinsic part of human make-up.

No. _____

10. In the baby's progressive discovery is his own body, the usual sequence is:

    a. hands, feet, mouth.

    b. hands, mouth, hunger.

    c. hands, genitals, feet.

    d. hands, feet, genitals.

11. In the course of development, the I.Q.:

    a. is likely to remain the same from test to test.

    b. is likely to vary from test to test.

    c. permits comparison of the individual's functioning at different ages.

    d. grows in direct proportion to the individual's growth in knowledge.

12. The following is probably best for the baby:

    a. breast-feeding.

    b. bottle-feeding.

    c. breast or bottle-feeding, as pediatrician recommends.

    d. the feeding method most comfortable for the mother.

13. A major difficulty in building a machine to take the place of mothers is:

    a. that machines cannot be made warm and snugly.

    b. that mothers have to change as their babies develop.

    c. that machines cannot be made to talk.

    d. none of the above.

No. _____

14. Nowadays, the maternal-deprivation syndrome is thought of as being caused by:

    a. lack of mother love.

    b. cultural deprivation.

    c. a variety of privations.

    d. a lack of physical exercise.

15. Stranger anxiety:

    a. is often a sign of incipient psychopathology.

    b. shows the "blood will tell," since the baby accepts his own kin and rejects outsiders.

    c. suggests that the baby has formed a scheme of the familiar against which he can recognize the unfamiliar.

    d. is most common in non-Western cultures.

16. The infant develops basic trust in his mother:

    a. because she attends to his physical needs on schedule.

    b. because he imprints on her during the first few hours after birth.

    c. out of the many social satisfactions involved in feeding, caretaking, and play.

    d. only if she avoids causing him distress during the first six months of life.

17. Institution babies may show:

    a. blunted responsiveness.

    b. retarded visually-guided grasping.

    c. linguistic impairment.

    d. all of the above.

No. _____

18. Critical period:

    a. occurs during a very serious illness.

    b. refers to a period of rapid growth and change in which the organism is maximally sensitive and vulnerable to the environment.

    c. is a psycholinguistic concept.

    d. starts in the intrauterine environment, continues through the birth process and infancy, and terminates during toddlerhood.

19. Age norms in development:

    a. apply equally to children in all cultural settings.

    b. may be impossible to establish because of cultural diversity.

    c. describe physical development accurately but are inapplicable to mental development.

    d. describe mental development accurately but are inapplicable to physical development.

20. The six or seven-month old infant drops objects from heights:

    a. as a way of getting mother angry.

    b. as a way of getting attention.

    c. as a method of exploring spatial relations.

    d. as a form of negativism.

21. A tendency of toddlers to go through a period of possessiveness probably:

    a. reflects their anal preoccupation.

    b. is an indication of growing self-awareness.

    c. is a precursor of the stingy character.

    d. has no meaning at all.

No. _____

22. Which emerges in toddlerhood?

a. solitary play.

b. parallel play.

c. associative play.

d. co-operative play.

23. Toddlerhood and the preschool years are especially unfavourable times for hospitalization and surgery because:

a. the child needs to be with his mother at all times.

b. the child is unable to tell the doctor where he is feeling pain.

c. this is the time when body integrity is the focus of many fears.

d. none of the above.

24. The preschool years are sometimes called the "first adolescence" because, in both the preschool years and adolescence, youngsters:

a. are very rebellious.

b. are making an important step away from the security of the family and are very ambivalent about their new independence.

c. cannot make up their minds about anything.

d. need to be very closely guided and regulated so that their more violent impulses will not lead them into actions that they may later regret.

25. Identification:

a. refers to the processes by which the child's behaviour comes to resemble that of consciously or unconsciously chosen models.

b. refers to the practice of issuing I.D. cards to adolescents.

c. if it occurs early enough, means that the young person will be spared the pain of an adolescent crisis of identity.

d. is usually with just one key figure, akin to the imprinting object in infrahuman species.

26. Schizophrenic breakdowns most frequently occur for the first time during:

    a. toddlerhood.

    b. preschool years.

    c. middle years.

    d. adolescence.

27. The following tasks can be performed better by middle-class four-year-olds than by culturally deprived children.

    a. knowing colour names.

    b. "running" paper and pencil mazes.

    c. completing a geometric figure with a piece missing.

    d. all of the above.

28. The middle years of childhood are called the "gang age":

    a. because of the child's strong allegiance to his peers.

    b. because of the high incidence of delinquency during this period.

    c. because the gang reinforces adult cultural values.

    d. because children date in groups.

29. The increasing length of adolescence is, in our culture:

    a. in part determined by our technologically advanced economy.

    b. due to the later onset of puberty in teenagers today.

    c. determined primarily by the later average age of marriage.

    d. none of the above.

No. _____

30. Secondary sex characteristics:

a. play a minor role in adolescent development.

b. are the character traits that go with being male or female.

c. are fully developed at birth.

d. include such features as facial and chest hair in boys, breast development in girls.

31. Mature status is generally granted earlier in:

a. the lower class.

b. the middle class.

c. the upper class.

d. is independent of class.

32. An adolescent change is:

a. nose and chin become more prominent.

b. shoulders broaden.

c. pulse rate increases.

d. all of the above.

33. Adolescent rebellion:

a. is just showing off.

b. challenges the value of adult society as a part of identity formation.

c. means quarreling with parents over money.

d. is a disguised expression of adolescent sexuality.

34. The term "egocentrism" refers to:

a. the child's preoccupation with his own concerns.

b. an unreasoned assumption that other people perceive things the same way you do.

c. a delusion that other people are always talking about you.

No. _____

35. Self-fulfilling prophecy

a. refers only to hopes.

b. refers only to fears.

c. means that children tend to become what we expect them to become.

d. means that children tend to become what they want to become.

36. The term "neurosis" refers to:

a. a neurological weakness.

b. feeble mindedness.

c. a conflict of innner tendencies.

d. suppressed homosexual wishes.

37. According to Freudian theorists, the middle years of childhood are an ideal time for formal education because:

a. the child has nothing else to think about following the resolution of the Oedipus complex.

b. Libidinal energies can be sublimated as intellectual processes.

c. the school teacher replaces the mother in the child's Oedipal fantasies.

d. the child's ritualism facilitates rote learning.

38. The doctrine of competence motivation says that:

a. the acquisition of knowledge and skills is intrinsically satisfying.

b. children are motivated to become competent by organ inferiority.

c. children become competent as a by-product of learning to satisfy basic needs.

d. children learn better in response to reward than to punishment.

No. _____

39. Classical conditioning:

a. means the pairing of a new signal stimulus with a naturally occurring response.

b. plays a central role in education.

c. has been combined with operant conditioning in a new system of psychotherapy.

d. none of the above.

40. Operant-conditioning techniques have proved most useful educationally:

a. at the preschool level.

b. in slum neighbourhoods, where almost indestructible teaching machines can take the place of scarce teachers, and where programs can be changed by the custodial staff according to a fixed schedule.

c. with those subject matters that can be broken down into small steps and arranged in logical sequence.

d. in training people to be creative.

41. The schedule of reinforcement that works best for retention is:

a. constant.

b. intermittent.

c. the one least expected by the subject.

d. the one most familiar to the subject.

42. Punishment does not seem to be a very effective means of preventing undesirable behaviour. This is most probably because:

a. punishment works best if it occurs very early in the total behavioural sequence, a condition hard to arrange outside the laboratory.

b. punishment outrages the child's natural sense of justice and provokes him to rebellion.

c. punishment is not compatible with love.

d. the child cannot tell the difference between systematic punishment and the occasional accidents that befall him even when he has been acting virtuously.

APPENDIX C

Mid-Course Student Reactions
Prepared by Dorene E. Jacobs

At the first week-end teach-in, held on March 3 and 4, 1973, a simple, open-ended questionnaire was distributed to the students present. The questionnaire contained two questions:

1. We'd like to know what you think about the radio programs. Please comment.
2. We'd like to know what you think about the television programs. Please comment.

Attached was a list of the radio and television programs broadcast between January 8 and March 4, 1973, with the dates indicated. The students were asked to mail the completed questionnaires to OECA.

The major purpose of this mini-questionnaire was exploratory, to gain some appreciation of the general attitudes of the students towards the media components of the course in order to provide a base for the construction of a final, structured questionnaire to be administered at the final week-end teach-in in May. This report provides a descriptive summary of the responses received, with a minimum of quantitative analysis, since the responses to the final questionnaire will be analyzed quantitatively. It should be pointed out, however, that some students made a number of comments in reply to each question while others made only one or two. All of the comments have been taken into account in this report and, in many instances, therefore, outnumber the actual number of questionnaires received.

Fifty-one questionnaires were returned. The responses ranged from, predominantly, positive comments about both radio and television broadcasts, to a much smaller proportion of negative comments about the media, and included suggestions for the improvement of both, together with comments about the radio open-line and other components of the radio programs, about some specific programs (both radio and television), about the instructor, and about Ryerson Open College in general.

Radio Broadcasts

Out of 100 comments about the radio broadcasts in general, 83% were favorable and 17% negative. Approximately one-third of the favorable comments indicated that the students found the radio broadcasts excellent, interesting, fantastic, helpful, enjoyable or good. A slightly smaller percentage emphasized the quality of the broadcasts--well-researched and planned, clearly presented, easy to follow. (Some mentioned that they found the lectures better "laid out" than many classroom lectures they had heard.) Almost the same number of comments related to the functions served by the radio programs--they clarified and supplemented the readings; they helped increase knowledge; the provided for better understanding of oneself and others; they were informative. A few comments indicated that the timing of the programs was good, with the flexibility (being able to hear the programs at different times) very much appreciated. A few mentioned that they found the opportunity to tape the programs helpful, and one student remarked that replaying the tapes helped to make up for the absense of direct interaction in the course. Student comments included the following:

- Lectures are concentrated and simplified for radio, which is an advantage.
- They are presented and timed in such a manner that the student does not feel he is being fed like a computor. (The instructor) takes her time and important facts are repeated or enlarged upon.
- The quality of the broadcasts and informative data enlarges on and confirms much haphazard study.

Of the 17 negative comments, a third cited poor radio reception. Four people found the radio lectures too fast for note taking or reflection, two lamented the lack of opportunity for interaction around the radio broadcasts, and one criticized the "style of the programs." One student questioned the accuracy of much of the factual information presented. Student comments:

- Mainly excellent, sometimes a bit to "chatty" and not quite as technical as I would like.
- There is a problem with the fact that you can't go off on a tangent or add an interviewer to clarify some point.
- It's difficult to discuss immediate questions.

In addition to these 100 general responses, there were 10 suggestions for improving the radio programs; most of these centered around the actual content or the presentation of material, such as provide more summaries, more feedback, and so on. With regard to content, there was a suggestion that the course should have been broken down into two parts--physiology and psychology--"Then we could have had more comprehensive physiology in the time spent on that section." Another said that the radio programs

should be more "practical, with songs, current events or other daily material." One student suggested that "it might be good to have a period of 'free-time' on the radio which would be filled up through requests of the students."

Over fifty comments concerned specific components of the radio broadcasts. These centered on the open-line, student discussions, assignment feedback, application programs, and interviews.

The radio open-line was seen as more useful than in the previous year. Of the 19 students discussing it, 11 found it helpful while only three were critical. Generally, the comments indicated that the students considered the open-line useful for clarifying or amplifying points made in the radio lectures or which had come up in their reading or in preparation of assignments. They also saw it as a means of increasing interaction among students, of being aware of the concerns and views of other students; the presence of students in the studio for the open-line sessions was seen as contributing to the quality of the open-line. One student commented that the open-line adds to the depth of program and therefore compensates for what one would be able to do in a regular classroom. One student stated that the "hidden identity" aspect of the calls encourages openness--"this helps us to realize that we are all basically the same in our doubts, fears, etc." A criticism which was frequent in the previous year was voiced by one student--"open line does sometimes tend to be a personal problem corner." But she showed some ambivalence--"Maybe this is good; I am not sure; participation probably is the important thing." Another student who indicated that she did not participate in the open-line (reason not given) said that she still found it helpful. Someone else, however, found the questions "rather irrelevant" and another said she didn't "get very much" from them. One student suggested that the open-line might include criticism by students of student feedback, and that perhaps a recording service might encourage participation from students who were shy or who were unavailable at broadcast time.

Specific comments about the other components of the radio broadcasts tended to be quite favorable, with the largest number of positive comments relating to the student discussions (eight positive to one negative), and assignment feedback receiving five positive and one negative, application broadcasts four positive and no negative, and interviews six positive to three negative comments. The student participation was seen as adding to the "liveliness" of the programs. One student commented that the "casual manner" which pertained in the students' discussions together with the open-line presented "a pleasant break from the more formal lectures." Assignment feedback was seen as an essential part of the course with one student asking for more time to be spent on this. However, one student felt that instead of talking about previous assignments, the time could be better spent "just commenting on our papers or talking personally to our tutors." The application broadcasts seem to have served their purpose in helping students understand how to apply theory to real life situations. Specific favorable mention was made by three students of the session on "maternal deprivation" with Betty Flint.

One student expressed a lukewarm opinion--"(they're) all right. If they don't impress you as important, you can always shut the radio off. I do in most cases."

The interviews received the most criticism, although a number of students found them beneficial as well. Several students found it difficult to understand Dr. Berg in the session on genetics. One student commented, "Interviews with people actively involved in working with children tend to be more interesting than with the experts who are espousing theories." This same student went on to say, "There appears to be a narrowness in choosing lay people to discuss their personal experiences with children. Up till now, only those with upper middle class values have been used." One student found the interviews with two mothers "tedious," and another suggested that fathers should have been interviewed as well--"What does a prospective father think about the future? How does he view the coming child?"

Television Broadcasts

Of over 100 general comments about the television programs, approximately 80 were favorable. Almost a third of the responses described the programs as excellent, enjoyable, helpful, interesting, entertaining, well-selected, or good. A slightly larger number of responses emphasized that they tied in well with the radio sessions; they provided perspective, were enlightening or pertinent. Included among this category of responses were comments to the effect that seeing reinforces the learning process, and that it clarifies and supplements the other course material, particularly the theory:

- The T.V. programs show the children at different stages and situations and help in a way that audio couldn't.
- It is much more fun to witness the various tests and experiments rather than read them as statistics.
- It is certainly interesting to view some of the theories we are taking which are applied to everyday life in the films.

A smaller number of the positive comments were directed towards the media itself--television adds diversity to the course; a multi-media approach makes learning more interesting; the television programs provide a good visual aid. One student, presumably from a small community, noted that the visual aid is particularly valued in the absence of many other learning resources such as libraries. One student commented that it was reassuring for the student to see the teacher--"she becomes more than just a voice." With regard to presentation, one student indicated that the comments before the film by the course instructors helped to highlight certain aspects of the film and provide information pertinent to the course as a whole.

While a few students liked the timing of the programs and the fact that they were repeated at different times, a quarter of the negative comments were critical of the timing of the programs. Almost a third of the respondents making negative comments said that they had not seen any or all of the programs, largely because of the timing or because of poor television reception in their areas.

Six people indicated that they thought the programs were "all right" or interesting, but not as useful as radio. In this vein, one student stated that the television programs were "not as necessary or as effective as the radio for me as I have had the opportunity to observe many children first hand." Another noted that,

> The time spent on the T.V. programs is perhaps not quite as informative as the time on the radio; however, it is probably more interesting and entertaining. So for the added enjoyment that they offer, I think that they are worthwhile, as keeping up interest is probably the greatest obstacle in sticking with a correspondence course.

Several students commented that the films were old. One said that the T.V. is "a little sterile, due to the age of the movies." This particular student modified the comment, however, by noting, as others had, that "the lecturers bring some aspects into perspective and that helps." Annoyance was expressed by some students that the discussion was sometimes cut off "in the middle of an interesting sentence." Another said that interviews with experts were best confined to radio, and likewise discussions among the teachers, unless the film has no commentary or needs explaining in some way.

Of the 27 suggestions for improving the television programs, 18 asked that more television programs be shown, some asking specifically for a program once a week and some for longer programs. Some people asked for better viewing times and for more repeat showings. Five persons suggested that more discussion should occur around the television programs, either in the form of a summary of the programs at the time or immediately afterwards, through the radio open-line, or through small group viewing and discussion in local public libraries. One person asked for a brief description of the films to be included in the schedule to aid recall. Another would have been interested in a film of the "Harlow" studies. Some students asked for more Canadian content, while one specifically asked for a comparison or contrast between "a typical Canadian family vis-a-vis a U.S. middle class family."

Of the specific programs, the two that received the most comment were "Shyness" and "Conscience of a Child." Both of these were well liked except that the latter also received a couple of critical comments. One student expressed a strong dislike for it--"I question the methodology and disagree with the conclusions drawn. To me it very strongly needed comments from the point of view of the whole outlook the course is trying to put forward." The one negative comment about "Shyness" said that the

film was well done, but "tended to be too pat and shallow for today's thinking on child behavior." "Embryology" received one favorable and "Growth of Love" one negative comment respectively. The latter, according to the comment, "was not in my opinion the best film. It didn't seem to get to the bottom of things. Comparisons with different cultures and Margaret Mead would have helped explain it more fully."

Course Instructor

A dozen comments referred to the Developmental Psychology instructor, all but one of them favorable and enthusiastic. Over half of the favorable comments were directed towards personality and style, and the balance towards the competence of the instructor. Below are some examples:

- Most of all, I like (her) easy-to-listen-to approach and delivery. Her lack of technical jargon and easy manner make every session great!
- A dedicated and stimulating teacher.
- Her warm personality generates confidence and evokes enthusiasm.
- I very much enjoy (her) positive approach to her subject. Her sense of humor is delightful. She is obviously a person who likes children and people and has had a great deal of experience with them--her knowledge has not been acquired solely from books.

The one negative comment related to radio presentation--"she comes across on the radio as somewhat condescending--as if she is 'talking down.' She does not give this impression at all in person."

Open College Concept

Although the questionnaire asked only about the radio and television programs, some students undertook to volunteer reactions to the Ryerson Open College generally. All 31 of their comments were favorable, citing the convenience of learning at home (no loss of time through illness, no interruptions, being able to study despite shift work, unable to leave home for classes because of children). A number of comments were addressed to the whole concept of the Open College as an excellent way of learning, particularly because of the absence of prerequisites for admission, thus making the courses accessible to students who could not otherwise have qualified for university admission. Some students compared the Open College with other post-secondary experiences they had had and indicated

a strong preference for the Open College, feeling that they had learned far more than in other institutions.

A number of students indicated that their success in the Sociology course the previous year had increased their self-confidence and motivated them to enrol in the Developmental Psychology course this year. Some indicated that they had recommended the Open College to other people, and some expressed the hope that the Open College would continue.

One student commented:

> The course as a whole is personally the best thing that has happened to me for years. It has re-awakened my mind and resulted in readin and related interests in areas such as patients and my own family, watching for T.V. programs connected with the humanities.

Conclusions

The preceding analysis, as pointed out earlier, was based on the responses to 51 open-ended questionnaires. On the whole, they indicate a high degree of satisfaction with the way in which both radio and television were being use in the Developmental Psychology course. If one can attempt to read between the lines and combine impressions from this with impressions gained from being present at the time these questionnaires were administered (at the March teach-in) together with awareness of the attitudes expressed by students in the previous year, a number of conclusions present themselves.

The level of satisfaction would seem to be reflected in the fact that no complaints were made about the heaviness of the course load or about difficulties in keeping up with the course. While it is true that no question was asked about these matters, it would seem logical to expect, from last year's experience, that if the students had any such complaints, they would have volunteered them in the same way that they proffered unsolicited comments about the value of the Open College.

A major source of satisfaction would seem to be the success of many of this year's students in the Introductory Sociology course in the previous two years. As a result, the students display less anxiety and have more self-confidence in their ability to achieve in the present course.

The radio open line seems to have been vastly improved over the previous year and the fact that students participated in the radio programs was very favorably received. This aspect of the course this year seemed to contribute towards a lessening of the sense of isolation which was so marked in the previous year, and to a feeling of greater interaction.

Seeing the instructor on the television programs also seemed to serve this purpose. There can still be detected a yearning for greater interaction, whether with more teach-ins (as requested last year) or with more opportunity for discussion, but there seems also to be an ambivalence about it. Time pressures and the convenience of home study, heavily cited as major reasons for enrolling in the course, might mitigate against actual participation should more frequent opportunities for meeting be provided. It may be the better part of wisdom to leave the students "a little bit hungry" for greater interaction while continuing to find ways of using the media that would lessen the feeling of isolation so sharply expressed in the previous year, although this year's course would seem to have had a certain degree of success in this direction.

As part of the generally increased satisfaction and self-confidence, the students seemed to feel a greater sense of support in their efforts. This is not intended as a criticism of the previous instructor as last year's students were high in their praise. However, the differing styles of the two instructors were discussed openly at the March teach-in, and it is possible that this difference could have contributed to the sense of well-being which many of this year's students have displayed. Or it may simply be that the separation of teaching and administration may in some imperceptible way have contributed to a different reaction on the part of the students to this year's experience, and thus have enhanced morale.

The television programs seem to have been more relevant this year, tieing in more closely with the course content. This fact has undoubtly led to the student demand for more programs.

The students seem to be displaying greater breadth and depth in their reactions to the media, to course content, and to the Open College itself. They are expressing greater appreciation of the multi-media nature of the course with emphasis on the variety and diversity offered as well as the reinforcement of learning which multi-media experiences provide. Even critical questions about specific aspects of the course were tempered by the suggestion that more than one purpose might be served by any component of the course; an example is the thought that the entertainment value of television might contribute to motivation to continue studying. Furthermore, specific criticisms regarding course content seemed to reveal a search for depth and breadth. And the comments about the Open College itself indicated an attempt to analyze the value of this kind of learning opportunity in comparison with others. One can begin to detect the beginning of an esprit de corps among these students; they are developing a sense of identity as members of the Open College and are consciously trying to evaluate it. This suggests that for many, especially those who had completed the first course, their sight has been lifted beyond the struggle merely to survive in the course, to a broader concern with the educational implications of this kind of learning.

All of these remarks must, of course, be tempered by the reminder that only 51 questionnaires were returned. At this stage, nothing is

known about the students who did not reply, including their reasons for not replying. Their attitudes could be similar to those expressed in the replies or they may not have responded because of dissatisfaction or difficulty in keeping up with the course. Unfortunately, this is an unanswerable question.

APPENDIX D

Significance of difference between Day and ROC knowledge post-test scores

As the difference between Day and ROC knowledge scores in the post-test was of the same approximate size as the standard deviations of each set of scores, it was necessary to determine whether the difference was significant. Here are the crucial data:

	ROC	Day
Means	Mr = 29.2069	Md = 25.3043
Standard deviations	Sr = 5.6871	Sd = 3.7999
Numbers of subjects	Nr = 58	Nd = 46

The ratio of the variances gives the following F value:

$F = Sr^2/Sd^2 = 32.38/14.44 = 2.2$

but for Nr-1=57 and Nd-1=45 degrees of freedom the 5% critical value of F is only about 1.7. Thus, it may be concluded that the population variances are not the same. Usually, t-tests postulate homoscedacity, involving the calculation of a common population variance. In this case, obviously no such animal exists. Nevertheless, one is still justified in undertaking a t - test for means with Sr^2 and Sd^2 used as estimates of the two population parameters. The appropriate formula is given by K.A. Yeomans in "Applied Statistics: Statistics for the Social Scientist" Vol. 2 (1968) p. 105. The calculated value of t is found from:

$$t = \frac{Mr - Md}{((Sr^2/Nr) + (Sd^2/Nd))^{\frac{1}{2}}}$$

$$= \frac{3.9026}{(0.5582 + 0.3139)^{\frac{1}{2}}}$$

$$= 3.9026/0.8721^{\frac{1}{2}}$$

$$= 4.17$$

Establishing the appropriate critical value of t raises the problem of deciding how many degrees of freedom should be used. An approximation for d.f. was calculated using a formula cited by Yeomans, but for present purposes it is more effective to adopt his alternative approach of estimating the critical value of t for a 1% level of significance directly from tr and td, the 1% significance values found by entering a table of the t-distribution for 57 and 45 degrees of freedom respectively. The calculation is:

$$t\ (1\%) = \frac{((Sr^2/Nr)\ X\ tr) + ((Sd^2/Nd)\ X\ td)}{(Sr^2/Nr) + (Sd^2/Nd)}$$

$$= \frac{(0.5582\ X\ 3.23) + (0.3139\ X\ 3.31)}{0.8721}$$

$$= 3.26$$

This value is considerably less than calculated t, so that at better than the 1% level of confidence, it must be concluded that there is a significant difference between the two sets of scores.

For the sake of completeness, it must be added that inspection of the data shows that the distributions of scores conform sufficiently to normality to satisfy the assumption of the t-test, which is, however, sufficiently robust to resist quite considerable divergences from normality. The score distributions are tabulated at the end of this appendix. But, in case anyone wishes to maintain that the post-test distributions are too skewed, the distribution-free median test was also carried out as a check. This test has a power which increases assymptotically to 63% as N increases, so it should be very conservative.

Chi-squared for the median test is obtained by first calculating the joint median of the ROC and Day scores, which is 28.5, and then setting up a 2 X 2 table thus:

	ROC	Day	Totals
Scores above joint median	40	12	52
Scores below joint median	18	34	52
Totals	58	46	104

Then we calculate chi-squared corrected for continuity by:

$$X^2 = \frac{104 \times ((140 \times 34) - (18 \times 12)) - (104/2))^2}{58 \times 46 \times 52 \times 52}$$

$$= \frac{104 \times 1092^2}{7,214,256}$$

$$= 17.1$$

The obtained value is greater than chi-squared at the 1000-to-1 confidence level, which puts the null hypothesis completely out of court.

Table 54. Knowledge score distributions.

Pre-test			Post-test		
	ROC	Day		ROC	Day
5		1	12	1	
9		1	16	1	
10		1	17	1	
11	2	-	18	-	2
12	2	1	19	1	2
13	-	2	20	-	2
14	-	5	21	1	2
15	2	3	22	2	2
16	1	3	23	3	5
17	2	4	24	4	1
18	1	3	25	-	7
19	5	7	26	1	4
20	3	3	27	1	6
21	1	6	28	4	3
22	2	3	29	3	3
23	4	1	30	9	4
24	5	-	31	4	2
25	9	-	32	8	-
26	3	2	33	3	1
27	3		34	2	
28	1		35	3	
29	5		36	-	
30	1		37	3	
31	-		38	2	
32	3		39	1	
33	1				
34	-				
35	1				
36	1				

APPENDIX E

Broadcasting Times Desired by ROC Students

To make it easier to identify popular times for radio-listening and television-viewing, half-hour periods nominated by five or more respondents are marked by a box. The number in each cell indicates the actual number of respondents desiring a broadcast during the half hour beginning at the time indicated on the right. Cells corresponding to actual times of broadcasts for the ROC course are marked by square brackets.

Table 55. Radio listening times desired.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
6:00 a.m.	1	1	1	1			
6:30 "	1	1	1	1			
7:00 "	1	1	1	1			
7:30 "	1	1	1	1			
8:00 "							
8:30 "	1						
9:00 "	2	2	2	1		1	1
9:30 "	2	2	1	2		2	1
10:00 "	2	2	1	2		1	1
10:30 "	3	3	2	3	1	1	1
11:00 "	2	2	1	2		1	1
11:30 "	1	2	1	2		1	[4]
12:00 noon	1	2	1	2	1	2	[5]
12:30 p.m.	1	1	1	1	1	2	[5]
1:00 "	2		2			1	3
1:30 "	[16]	6	[18]	5	5	1	5
2:00 "	[14]	6	[16]	5	4	1	3
2:30 "	4	3	4	2	3	1	2
3:00 "	1	1	1		1	1	1
3:30 "						1	1
4:00 "						2	2
4:30 "						2	2
5:00 "						2	2
5:30 "						2	2
6:00 "	2	2	2	2	1	1	1
6:30 "	2	2	2	2	1	1	1
7:00 "	3	3	3	3	1	1	1
7:30 "	4	4	4	4	2	3	1
8:00 "	6	5	6	6	3	3	1
8:30 "	7	6	7	7	4	4	3
9:00 "	[14]	9	[14]	9	3	2	4
9:30 "	[13]	9	[13]	9	3	1	3
10:00 "	5	3	5	3	1		
10:30 "	2	1	1	1			
11:00 "							
11:30							

Table 56. Television-viewing times desired.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
6:00 a.m.							
6:30 "	1	1	1	1			
7:00 "	1	1	1	1			
7:30 "	1	1	1	1			
8:00 "						1	
8:30 "						[1]	
9:00 "	[6]	4	4	3	2	4	3
9:30 "	[5]	[6]	3	3	2	3	2
10:00 "	4	4	3	3	3	4	4
10:30 "	4	4	3	3	3	3	3
11:00 "	3	2	1	1	1	3	4
11:30 "	2	1	1	1	1	3	4
12:00 noon						3	4
12:30 p.m.						3	4
1:00 p.m.	1	1	2	1		3	[6]
1:30 "	3	3	4	2	2	3	[6]
2:00 "	2	2	2	1	1	3	[5]
2:30 "	2	2	2	1	1	3	[5]
3:00 "	1	1	1		1	3	3
3:30 "						3	3
4:00 "						3	3
4:30 "						3	3
5:00 "	1	1	1	1	1	3	2
5:30 "	1	1	1	1	1	3	2
6:00 "	1					3	2
6:30 "	2	1	1	1		3	2
7:00 "	2	2	2	2	1	4	3
7:30 "	[6]	[5]	[5]	[5]	3	[6]	4
8:00 "	[9]	[7]	[6]	[7]	3	[6]	4
8:30 "	[5]	[6]	[5]	[5]	3	[6]	4
9:00 "	[5]	[6]	[5]	4	2	4	3
9:30 "	[5]	[6]	[5]	[5]	3	4	3
10:00 "	1	1	1	2		1	1
10:30 "	1	1	1	2		1	1
11:00 "				1			
11:30 "							

Table 57. General times desired for television-viewing (and, in parentheses, for radio-listening)

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Any time	4 (3)	3 (3)	3 (3)	3 (3)	1 (2)	3 (3)	3 (3)
Present hours	1 (1)	1 (1)	1 (1)	1 (1)	1 (1)	1 (1)	1 (1)
Morning						1	1
Afternoon						(1)	(2)
Early evening					(1)		
Evening	1 (1)	1 (1)	1 (1)	1 (1)	1 (1)	1	1